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```
hawaii :  NET/ROM Link to Univ. of Hawaii - 'OLULU:kh6tz'
utah   :  AX25 Link to Univ. of Utah - Salt Lake City, Utah
          'wa7slg-3'
moscow :  AX25 Link to Moscow, Russia - 'ra3apw-7'
texas  :  NET/ROM Link to Houston, Texas - '4c0589:f6cnb-8'
gsfc   :  NET/ROM Link to NASA / GSFC - 'GARC:wa3nan-9'
canber :  NET/ROM Link to Canberra, Australia - 'ACT:vk1bud-5'
buda   :  AX25 Link to Budapest, Hungary - 'ha5kfu-1'
ttyb
ttya   :  JPLGW <--> JPLARC <--> Los Angeles, California USA

JPLGW:W6VIO-14 Area: g3zcz Current msg# 0.
?,A,B,C,D,E,F,H,I,IH,IP,J,K,L,M,N,NR,P,R,S,T,U,V,W,X,Z >
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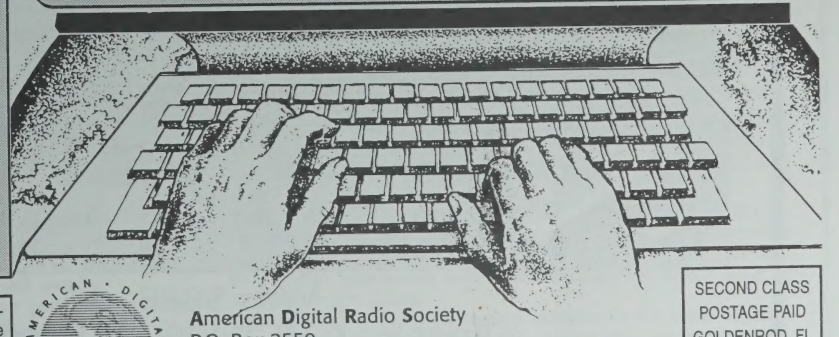
This is VHF Packet??? - See Page 10



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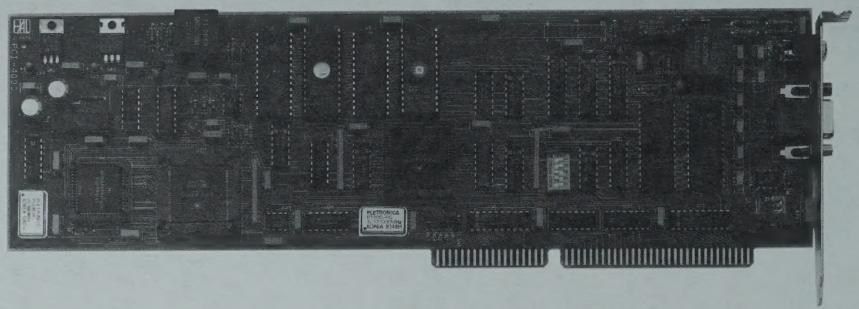

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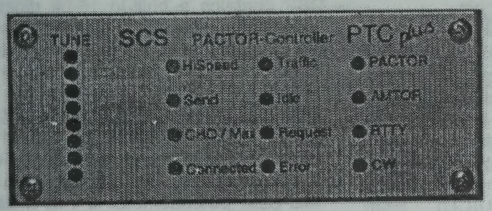

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Pactor II - Part II

The New Dimension in Data Transmission Technology

by Dr. Tom Rink, DL2FAK and Dipl.-Ing. Martin Clas, DL1ZAM
SCS Communications • Röntgenstraße 36 • D-63454 Hanau • Germany

This is the second of a series of articles that describes the PACTOR-II system and the ideas behind it. In this second chapter, we explain the final version of the PTC-II hardware. The third part, with details on the PACTOR-II protocol, follows in the March issue. Finally, in the April issue, we will answer questions on the system that have accumulated at the ADRS offices. Please send your questions to ADRS at the Goldenrod, FL address.

I. Introduction

As already indicated in the first part, the DPSK modulation system makes it mandatory to use a DSP as the interface to the short wave transceiver. Additionally, the convolutional coding with the Viterbi decoder requires very high processing power, more than available in any existing modem on the Amateur Radio market.

In addition, the many wishes, ideas and suggestions from the ranks of the Radio Amateurs led to the development of an even more complex and flexible unit than necessary to implement the basic PACTOR-II system. For example, many wished to be able to operate not only with usual digital HF modes, but also to cover VHF and UHF Packet Radio at the same time, with one unit. Unlike today's existing units, a comfortable built-in mailbox should allow simultaneous access from all communications channels with the same priority—for example in Packet Radio on 23 cms with 9600 baud and on

70 cms with 1200 baud. Naturally, during this time no PACTOR or AMTOR connect on HF should be lost or ignored. This forces the use of a RISC (Reduced Instruction Set) processor for fast processing of the HDLC Packet protocols. As the majority of modern HF transceivers can be programmed via a serial interface, many wish to use this feature for remote control of the transceiver. To set up a mailbox that scans various frequencies on HF, external computer and software is no longer required. Additionally, you could utilize your home based PTC-II whilst on the move, or from a remote location using Packet Radio. Instruct the HF transceiver to tune to a specific frequency, then to make a connect in PACTOR to a particular mailbox and read the messages.

These and many more ideas have led to hardware of very high performance. Due to the use of signal processing, the PTC-II is very flexible, and allows a great variety of different applications to be implemented. These range far wider than those written of up to now. Those technically talented users can make their own programs and modules, which may be loaded via the serial interface into the flash memory of the PTC-II. The possible uses are almost unlimited, as the PTC-II provides a complete, very high performance development platform for DSP and 68020 applications. From simple external control functions (e. g. automatically turning the antenna to the connecting station), or audio processing functions (e. g. super-steep sided FIR filters 400th order for CW, automatic N-times notch filters, etc.) right up to complex functions, like an audio spectrum analyzer or extra operating modes, whether known or still to be invented, may be implemented.

The PTC-II comes on the market this month. However, as some of the components used, among them the new DSP chip, are still difficult to get and due to the great demand for the PTC-II, the time of delivery for a unit is currently about 6 weeks. (The price of the basic version of the PTC-II with 512k static RAM is $950 US, plus shipping).

II. The Processor Section

As has been made clear in the introduction, to achieve simultaneous processing of three communications channels along with the signal coding of PACTOR-II, a powerful computer is essential. A 32-bit processor system has been designed, based on the new communications processor 68360 (QUICC) from Motorola. This processor contains an expanded 32-bit version of the well known 68020 CPU, as used in many powerful computers, together with four separate programmable serial communications ports, the so-called SCC's, implemented as a RISC processor. Two of these SCC's serve as interfaces to the Packet Radio modems. The third SCC is used as RS-232 interface to the terminal. A buffer chip MAX207A provides the correct RS-232 voltage levels. The baud rate to the terminal is detected automatically, but can also be determined by software command. The last remaining SCC serves as interface to the HF transceiver for remote control purposes. Four RAM chips with 8 bits each are required, to cover the 32 bit wide data bus. These can vary between 4 times 32k x 8 up to 4 times 512k x 8. The PTC-II can therefore have a maximum of 2 MB of static RAM, which plays a large part in running the mailbox and internal administration as well as external programs, that may be loaded into the PTC-II in addition to the operating software. In order to further expand the possible applications, the PTC-II may also contain additional dynamic RAM in the form of a 72 pin SIMM module of up to 32 MB. The operating system is to be found in a flash memory of up to 512k*8. Additionally, it is possible to load programs over the serial interface from the terminal, which would enable the PTC-II to do a totally different job, as already mentioned in the introduction. Operating parameters for the PTC-II that should be resistant even to a deep reset are also stored in the flash memory. Data in this kind of memory remains stored even when no voltage is applied, but contrary to an EPROM, it may be electrically erased and re-written whilst in circuit. That makes it very easy updating the system or running different programs on the PTC-II. A battery-backed-up real-time clock and other features of the previous PTC are of course still included.

III. The HF Modem with Signal-Processor

The 50 MHz version of the XC56156 DSP from Motorola forms the interface to the HF transceiver. As the clock frequency is programmable, it is automatically adjusted to suit the work of the moment. For easy tasks, such as FSK, the processing speed can be reduced, yielding a corresponding saving in energy. The DSP contains a built-in 16-bit digital to analog converter, with the help of which the audio output signal to the transceiver is generated, be it simple AFSK or the complex phase modulation of PACTOR-II. The output amplitude is also programmable and may be set in the range between 10 and 4000 mV by software command. The normally required 'Mic Gain' potentiometer is thus missing. It is also possible for the PTC-II to control the output power of the transceiver, so that the power to maintain the link may automatically be adjusted to an optimum value. This not only saves on the electricity bills, but can considerably extend the life of transmitting components and also causes less interference to other stations.

For the signal input, the DSP uses a Sigma/Delta analog to digital converter with a 16-bit dynamic range (14 bit effective), which enables the normally necessary Anti-Aliasing filter to be dispensed with. With the exception of the decoupling OP-AMP at the input and output of the DSP, no further components in the

signal path are required. The DSP contains some built-in static RAM, which in the PTC-II, is further expanded with 4 additional, very fast, static RAM's. The size of this RAM is 64k-words (16 bit) and is not variable. This enables difficult algorithms, for example 4096 point FFT, to be used. As the DSP has direct access to the main processor data bus, it does not tie up an SCC. The exact receive frequency of PACTOR-II is very quickly and reliably adjusted by software, using a newly-developed tracking method. In addition, the DSP is able, through pulsing the up/down function (which almost every modern transceiver has as microphone buttons) to automatically change the tuning for optimum results. The up/down keys are simulated by transistors, which pull the respective connection to ground.

IV. The PTC-II Power Supply

The PTC-II contains two power supply input options. Either it may be supplied via a special DC input connector, or directly from the HF transceiver via the connecting cable and socket. The two options are decoupled via diodes and feed a switching regulator. This has a high efficiency, and generates the 5V supply for the digital section. The supply voltage can vary between 8 and 20 volts. The current requirement, due to the use of the switching regulator, is dependent upon the supply voltage and the Packet Radio modems used. The higher the supply voltage, the lower the current consumption. This reverse proportionality is due to the fact that the power consumed is a product of voltage and current, and must be virtually the same before and after the regulator. The efficiency of the regulator is almost unaffected by the value of the supply voltage. The power supply input of the PTC-II contains special filtering, so that the switching harmonics from the regulator cannot reach the outside world. The operating voltage is internally fused with a 5x20 mm fuse. Of course an extra fuse is delivered with each unit to prevent problems in countries with different standards.

V. The Display and Indicator Unit

The display and indicator unit is built on a separate circuit board, and sits at right angles to the main board, connected by soldering pads. It carries a tuning indicator of 15 LED's, 15 further LED's to display the various operating parameters and a 10-character 5x5 dot matrix LED display. Most of the LED's, including the tuning indicator, are dual colour types, to increase the information density and the ease of reading the display. The tuning indicator, for example, changes from red to green as soon as the tuning is optimum for the chosen operating mode. The 10-character LED display shows the operating mode and thus eases the display of any possible future update modes, as the PTC-II is more than sufficient for modes such as FAX, CLOVER-II, etc. Additionally, various status information as well as the call of connecting stations is also given on this display, thus in many cases there will be no need to switch on a terminal. The display is readable from a distance and from unsuitable viewing angles. The brightness is programmable and can be adjusted by a software command.

VI. The Packet Radio Modems

The ability to operate Packet Radio with the PTC-II is an integral part of the operating system, and therefore available on all units. The PTC-II is, however, mainly an HF controller, and thus the Packet Radio modems are implemented as modules, to be plugged in if the need arises. This enables a certain amount of mechanical compactness (the entire PTC-II is approximately the size of a modern VHF mobile transceiver). It also prevents those who only need an HF system from being forced to pay for an unwanted Packet Radio modem. The PTC-II contains connectors in the form of double PCB strip headers, on to which the modems can be easily plugged as required. There is space provided for two modems, which are automatically sensed when present. Two types of Packet Radio modems will be offered. A simple and cheaper version using the well-known modem chip TCM3105 for 1200/2400 baud, as well as a version with the XC56156 DSP chip. The DSP version is able to accommodate all baud rates from 300 to 9600 baud. The switch-

(cont'd on page 7)

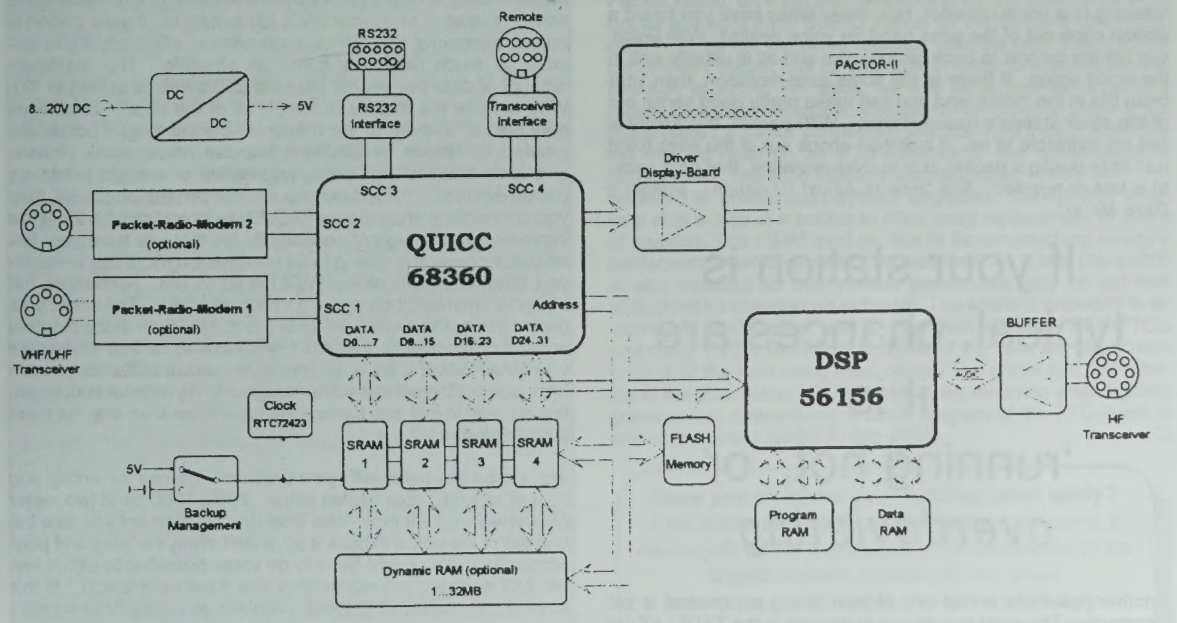

Figure 1: Block diagram of the PTC-II

Packet Power

Q & A

©1995 by Dave Wolf, WO5H dba Maingate Resources
P.O. Box 189, Burleson TX 76097-0189 / CompuServe ID: 73427,2246

This if the first installment of Packet Power Q&A. Every other month, we will answer some of the questions that arrive at *Post Office Box 189, Burleson, Texas 76097-0189.*

This month's question comes from Jim Hastings, KD8LZ, in Kalamazoo, Michigan. Jim writes:

> *Many times I initiate a packet connection and get a strong, quick response resulting in a fine initial connect, but then the data stream falters, either in the follow-up connect message ..., or when I send along the second initiative from my station, such as a query for a traffic list or even a first line in a normal QSO. Then the system shows many repeat tries or else just sits there with no response from the other station. Sometimes it won't even time out, meaning I have to issue a disconnect to end it all.*

If you're having connect difficulties, observe whether it's with one station or with a bunch of them. If you are having connect problems with numerous stations, then it's time to start exploring what is wrong with your packet station. This we'll do by taking a look at several strategic adjustments- some software, some hardware. This is an article on troubleshooting a connect problem rather than a comprehensive guide to optimum packet settings; all packet settings will not discussed. This information might be useful in understanding what these settings do, even if your packet station is functioning quite normally.

The first thing you should check is your deviation. If your station is typical, chances are it is 'running hot,' or *overdeviating.* When listening to a voice repeater, how many times have you heard a station chop out of the pass band on voice peaks? With voice, you tell the person to back off the mike and all is usually well in the world again. If there is still some over-deviation, then your brain fills in the 'holes' and you can make pretty good sense out of the other station's transmissions. With packet, this luxury is just not available to us. If a station chops out of the pass band *just once* during a packet, due to over-deviation, that data packet is lost or rejected. *See "How to Adjust Deviation ...without a Deve Meter"*

If your station is typical, chances are it is 'running hot,' or *overdeviating.*

Another possibility is that one of your timing parameters is set incorrectly. The most logical one to explore is the TXDELAY (or *TXD* on some TNCs). TXDELAY is the length of time between when your transmitter is keyed and data begins. Most TNCs come out of the box with a setting of 30, which corresponds to a delay of 300 milliseconds. Most very modern rigs, operated barefoot, will work just fine with this default. If you use an older radio (5 years +), or any transceiver with an amplifier, this setting may have to be increased, sometimes significantly. If you use an amp, set TXDELAY to 50. Remember that now you are waiting not only for your rig to start transmitting and stabilize; you are waiting for the amp to come up to maximum and stabilize, too. Some older amps may take a TXDELAY of 70, so this setting may require some experimentation. If you rig is so old that it takes such incredibly long delays, consider replacing it if you are serious about packet operating. The latest rigs designed with packet in mind may be operated with a TXDELAY of 25. 9600 baud FSK packet uses TXDs of less than 10 Talk about fast turn-around time!

How's your EQ? No, not your IQ, your EQ, or *equalization*? 1200-baud AFSK packet uses mark and space tones, just like RTTY, AMTOR, etc.! From your RTTY experience, you remember that mark and space must be of approximately the same amplitude and lie within the pass band of the transmitter filtering. If mark or space is skewed out of the pass band, or the amplitude of one is significantly different than the other, other stations might have trouble copying your signals. There is an EQ setting on your TNC, most likely a DIP jumper. Check your owner's manual for instructions on the default setting of the EQ, and how to change it if you suspect that it is not correct for your setup. TNCs typically are designed so that default EQ is a good match for the pre emphasis/de emphasis of FM voice transceivers. Restore your EQ to default if it is not there already and use this as a starting place. I have used default equalization settings with dozens of TNC/radio combinations and always had good luck.

What about your packet length? There is a setting called PACLEN. This determines how much *real data* is sent in each packet frame. In a packet frame, the amount of overhead is the same, no matter what your PACLEN setting is. If your station is adjusted properly, you will obtain maximum efficiency if you can cram as much data in a frame as possible. The maximum amount of data per packet frame is 256 bytes (a setting of '0'). Why not use the maximum length all of the time? Conditions may not be 'friendly' to the maximum packet length: conditions created by hidden transmitters; impulse noise; weak signals; and other stations with overly-aggressive or outright predatory packet settings. To find out if a shorter packet length will help your connectivity, shorten your PACLEN to 32 and give it a try. If this improves your throughput consistently (so that you have very few retries), increase this setting to 64 and give it a try. If this works for you, then consider bumping PACLEN up to 128. Remember, the higher this number, the longer your packet frame is. The longer your packet frame, the more vulnerable it is to 'hits' from those potential sources of interference over which you have no control. Make sure your MAXFRAME is set to 1. This is the number of frames you can have outstanding without acknowledgment. If you have trouble getting an 'ack' to just one frame, why have more than one out there susceptible to hits?

Jim, I hope this helps with your problem. Thanks for writing and best of luck with your packet setup. While 1200 baud two meter packet will work for most folks from the first moment you take the unit out of the box and hook it up, it isn't always a 'plug and play' proposition. You might have to do some tweaking to signal levels and software adjustments to fine tune your setup. If this were not the case, all of these variables would be hard-wired!

Until next month, keep using your Packet Power! ❑

SIDEBAR

How to Adjust Deviation ...without a Deve Meter

The optimum method for deviation setting is with a deviation meter or with a service monitor. If you have $170 to invest in a deviation meter, AEA offers one for amateur packet that works on the two-meter, 222 MHz and 440 MHz bands. I have not had one in hand, so cannot tell you how easy it is to get your deviation adjusted with one. I do know from experience with packet network backbone adjustment that 9600 baud FSK is very sensitive to deviation adjustment. If you do not have a sophisticated way of adjusting deviation for 9600 baud, don't make the investment yet!

Okay, so you don't have a service monitor or deviation meter. How are you going to make sure your packet signals aren't over deviating? You can make the adjustment by ear and come pretty close! It is essential to have a second rig or a scanner tuned to your output frequency. You will also need to know which pot in your TNC affects the audio output level. Bless the TNC makers who have the consideration to make this pot accessible from the outside of the unit with the case closed! I suggest you use the low power setting and find a clear frequency where your tests won't disturb other operations. Issue a connect attempt to your own call or to 'test.' While listening to your own sigs, slowly run the pot through its range so that you can hear a variation in audio signal level. You are not adjusting for maximum signal strength, so don't bother watching the S meter. This is FM, so the signal strength will be consistent. You are adjusting for relative difference in audio signal, so you must use your ears! If it helps to close your eyes, then do so. Chances are you will have to go through several transmitting cycles, so be ready to key in the 'connect to' data again in the middle of your adjustments. You will notice that as you advance the pot, there will be a spot beyond which the signal doesn't sound much louder. This is where the limiting of the transmitter and possibly the receiver is coming into play, and is a critical point. Now adjust the pot so the signal level is approximately half the volume that it was from the critical point. You should be very close to the 3 kHz optimum deviation. If you are a little below, this is okay, because it is better to err on the low side. It shouldn't be so low, however, that the signal-to-noise ratio falls below a usable level on marginal paths.

Now button everything back up and make some connects to check out your changes!

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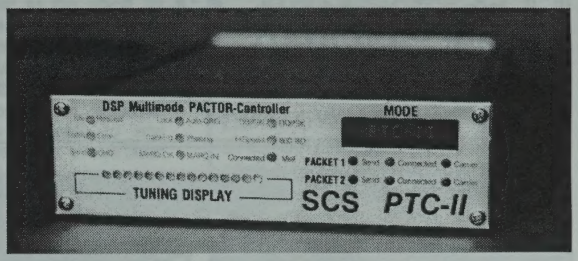
(Pactor II - cont'd on page 7)



ing is accomplished by a software command. DSP programming and the clock are supplied from the main board, so that, apart from the DSP chip itself, virtually no extra components are required for the signal processing. Additionally, the DSP modem board has space for an EPROM and its own clock generator, as well as baud rate switching. These enable the modem board also to be used either as a stand-alone modem, or together with other equipment. It delivers the usual Packet Radio signals of RxD, RxClock, TxD, TxClock and DCD. It is thus compatible with all other Packet Radio systems. Even the connections to the double PCB strip header are compatible with the usual Packet Radio system standards.

The Packet Radio boards are not yet available however. They will come on the market in the middle of the year, together with the corresponding firmware upgrade for the PTC-II.

VII. The PTC-II Construction

The PTC-II is made up of two printed boards, a main board of 147x170 mm, and a front board which, as described above, contains the displays and is mounted at right angles to the main board. The main board is a 6-level multi-layer construction and contains internal ground and supply voltage areas. On the back is the DC input connector, an on/off switch, an 8 pin DIN connector for the HF transceiver, two 5 pin DIN connectors for Packet Radio, an 8 pin Mini-DIN socket for the transceiver control as well as a 9 pin SUB-D socket for the terminal connector. All DIN plugs are delivered together with the unit. Every single pin of every socket has its own filter in order to improve the HF rejection in strong RF fields, as well as to prevent unwanted radiation of electromagnetic energy. On the front is a row of 52 finger-pads for solder connection with the front board, a mounting method used on all SCS controllers. The construction is largely SMD. The flash memory and four static RAM's are socketed to enable easy system upgrades. The RS-232 interface chip is also in a socket to allow easy replacement in event of damage. The SIMM module, due to its construction, needs a holder without which it cannot be mounted. An 8 way DIL switch is also included so that various parameters may be set that should not be changed via software. The whole is enclosed in an aluminum profile case, well known from previous SCS-PTC's and many TNC's. Both front and rear of the case are silk-screen printed, at the front using three colors. The green and red lettering of the dual colour LED's explain their meaning when lighting green or red, respectively. A block diagram of the PTC-II unit is shown in figure 1 earlier in this article. ❑

Have you checked your mailing label lately?
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The Contest Chair

Hints, Tips & Inspiration for Better Scores

by Ron Stailey, AB5KD • 504 Dove Haven Dr • Round Rock, TX 78664
Internet: ron481@austin,relay.ucm.org

Hello Contesters/DXers. February brings the New ADRS WW WPX Contest. This will be our first time as a solo host of a contest with out any support from anyone. We are praying for a big turnout. The best part of this contest is that can be won from any place in the world . . . even the USA And it's a lot of fun, even if your not a contester. At this time I have sent out some 120 requests for rules, from individuals world-wide (both on Internet and mail). As for the WPX contest all Remarks, Comments, Suggestions or Criticisms are welcome. We want a good and fair contest, to all participants. If changes are needed we will definitely take a hard look at it. Send all comments etc. to AB5KD.

This month I would like for you to talk about a M/S contest station that is quite new to RTTY contesting. Roger Ward GW5NF of Newport, Wales. Roger's crew usually consists of Julian GW4JBQ and Kirby G4VXE. They are all members of the (Red Dragon Contest Group-GW8GT) and they are all experienced contesters in SSB and CW modes. They attained some pretty fair results for their first time out, in digital contesting as well. SARTG'93 was there first digital contest. CQ/DJWW is Roger's favorite. Here are some results:

SARTG'93 6th Place WW M/S Category Score: 329.130
CQ/RJWW'93 6th Place Europe M/S Category Score: 665.575
Roundup'94 1st Place DX High Power M/S Category Score: 42.030
(The 3rd highest score ever scored in the DX M/S high power category)
BARTG'94 2nd Place WW M/S Category Score: 657.624

So far they have used Roger's station, but hope to use GW8GT during CQ/DJWW'95. GW5NF and GW8GT are almost side by side, with GW8GT being some 150 feet higher in elevation on top of a hill.

GW5NF station- Consists of a KLM KT34XA at 55 ft. An Inverted V for 40 and 80 meters. Station is 850 above sea level. As you may have guessed Roger lives on a farm, but suffers some antenna restrictions around the house because of overhead power lines.

GW8GT station is 1000 feet above sea level. It consists of a KLM kt34XA at 80 feet; a 2 element quad at 80 ft. for 40 meters, plus two more 80 ft. Towers from which they suspend various wires for 80 and 160 meters. Roger says, "Hopefully we will improve their performance on 40 and 80 during CQ/DJWW'95. He added, "We don't use GW8GT for every contest as we need an extra day to get all the antennas up. Unfortunately they can't leave coax out, because it gets stolen". (Note: Now there is a tactic I've never thought of!!! Stealing competitors coax! Hmmmm!!!)

Roger and crew only used one radio during all previous M/S contests— a Kenwood TS-440 plus a home brew amplifier (2X3-500Z's). For CQ/DJWW they hope to run two rigs, adding a Kenwood TS-450.

Their computer is a 286-12 and a PK-232, running RTTY by WF1B as software. Tuning is via the LED bars at the moment. But, they are considering using a scope in the future.

They are usually on 40 and 80 during the nighttime i.e. 2200 to 0800 UTC and are looking to improve their performance on these bands during CQ/DJWW'95.

Roger feels they tend mostly to CQ-ing but hunt and pounce for multipliers from time to time. They also use the Packet Cluster. Hopefully the second radio will enable them to spend more time running, using the second rig to spot multipliers. Roger says that hey are definitely new to RTTY contesting, but are now firmly hooked. "It has got to be the most relaxing form of contesting there is."

I would like to thank Roger for all his help in preparing this article and I would like to wish you all the best of luck in all your contesting efforts.

Next month a special column on Jay WX0B. Jay is a specialist in single tower contest stations. I'll just bet he can help you improve your contesting scores.

Until next time, 73's de Ron AB5KD

"Remember" Big Antennas high in the sky work better than little ones close to the ground...

SARTG CALENDAR OF EVENTS 1995

Jan. 1	0800—1100 UTC	SARTG New Year HF-RTTY Contest 3,5 & 7 MHz
Jan. 1	1300—1500 UTC	SARTG New Year VHF-RTTY Contest 144 MHz
Apr. 2	1300—1500 UTC	SARTG VHF-RTTY Activity Contest 144 MHz
Apr. 15	0000—0800 UTC	SARTG World-Wide AMTOR Contest 3,7-7-14-21-28 MHz
Apr. 15	1600—2400 UTC	SARTG World-Wide AMTOR Contest 3,5-7-14-21-28 MHz
Apr. 16	0800—1600 UTC	SARTG World-Wide AMTOR Contest 3,5-7-14-21-28 MHz
Jul. 2	1300—1500 UTC	SARTG VHF-RTTY Activity Contest 144 MHz
Aug. 19	0000—0800 UTC	SARTG World-Wide RTTY Contest 3,5-7-14-21-28 MHz
Aug. 19	1600—2400 UTC	SARTG World-Wide RTTY Contest 3,5-7-14-21-28 MHz
Aug. 20	0800—1600 UTC	SARTG World-Wide RTTY Contest 3,5-7-14-21-28 MHz
Oct. 1	1300—1500 UTZ	SARTG VHF-RTTY Activity Contest 144 MHz

Rules & Results are obtaineable through SARTG Contest Manager:

SARTG
Scandinavian Amateur Radio Teleprinter Group

Bo Ohlsson SM4CMG
Skulsta 1258
S-710 41 FELLINGSBRO
Sweden

Hits & Misses

by Dale Sinner, W6IWO • 1904 Carolton Ln • Fallbrook, CA 92028
CompuServe ID: 73074,435

1995 ALREADY

Golly, now I have to think about what I am going to accomplish this year. Ugh! New Year's resolutions, unfinished projects, people to see, places to go, on and on it goes. Ba Hum Bug! Why can't I just hibernate until next year, then maybe I'll be in a better frame of mind to think about how and what I want to do with the new year? Woooe! Is that really me thinking such thoughts? Wow, I must have lost my mind there for a minute. I couldn't let the family down, the ADRS down, the whole world down. No not me, besides, hibernation would probably be boring. Nothing to eat, no one to see, no one to talk to, total inactivity. That's not for me, so I better get on with 1995 and forget such notions.

MIAMI BOUND

For those of you in the greater Miami area, I will be attending the Tropical Hamboree, February 4 & 5. The ADRS will have a booth that will be attended by Jim Mortensen, N2HOS, Paul Richter, W4ZB, A1 Matlick, W2TKU, and myself to name a few. Be sure to stop by our booth and get acquainted with some of the ADRS personnel. We look forward to meeting you and listening to your comments about the digital modes. Our booth number is 311.

The ADRS also has a "Digital Digest" forum scheduled for Saturday. Check your program for the exact time. The topic will be "The advancement of the digital modes. What's next?" the featured speakers will be Bill Henry, K9GWT and myself. See you there.

DAYTON ROOMS

By the time this issue reaches you there will only be a few weeks left before the Hamvention. If you have just found out that you will be able to attend and will need a room, give me a call. There may still be some rooms available. Sometimes at the last minute, I get a cancellation, making it possible for last minute add-ons. Don't hesitate to call if you plan to go and need a room. My number is (619) 723-3838, phone or FAX.

DAYTON EVENTS

If you are arriving Thursday night, stop by the hotel lounge. Here you will find an informal get together of all the early bird digital types. It's a great chance to meet and exchange stories and create new friendships. It is not unusual to find 20 of our gang hanging out and enjoying the fellowship.

Friday is packed with exciting events, starting with some miniforums at the hotel. These forums will be held in the Jade II room where the hospitality suite is also held on Friday night. The morning sessions will be completed in time for you to get over to the arena for Hamvention opening which is at noon. Again this year for those without transportation to the Hamvention, buses will be available to and from the arena for a nominal fee. I have been informed the Dxers and Contesters are also having a dinner for this evening. Watch for details in the journal.

Saturday will be another busy day for the digital gang. The "Digital Digest" forum will be held in the arena at 11:00 A.M. (time not firm). I should have a firm commitment by next month. Saturday evening will be the "Digital Journal Dinner" at the hotel. You will find ticket information elsewhere in this issue. Sign up early and enjoy an evening with your friends. The price of the dinner this year will again only be $23.00. After dinner, this year's MC (Jim Mortensen, N2HOS) will conduct a short program. He has awards to present, a door prize to give away, and there will be a guest speaker. When this event closes, all are invited back to the hospitality suite for informal visiting. Each year the hospitality suite attracts a throng. You don't want to miss either Friday or Saturday night in the hospitality suite. All complements of the ADRS.

When it comes to having fun at Dayton, we digital types really know how to do it up right. I don't' know of another group that has so many events happening on this weekend. From technical forums to parties, the ADRS is rolling out the red carpet. No stone will be left unturned to bring you the best Hamvention ever. Be there, be a part of Dayton 95.

All for this month. See you in Miami or on the bands.

73 de Dale, W6IWO

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Esta revista se publica bimestralmente y en una de las páginas iniciales se indica cómo subscribirse. El precio de la subscripción, seis ejemplares anuales que incluyen la **GUIA DE EQUIPOS y ACCESORIOS** (edición de Noviembre/Diciembre), en sobre cerrado, por vía aérea al domicilio del lector, es de US$40.00 para todos los países con exclusión de México y Canadá. En razón de las más bajas tarifas postales, para los dos últimos la subscripción anual cuesta US$20.00. Para los Estados Unidos y Puerto Rico el precio de la subscripción anual es de US$18.00. Los pagos deben hacerse en moneda norteamericana mediante cheque de cuenta bancaria en los Estados Unidos, cheques de viajero, giro postal u orden de pago internacional a nombre de:

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Digital Journal Dinner

Dayton Hamvention
Saturday April 29, 1995
Regency Ballroom - Radisson Inn

If you plan to attend this gala affair, you must pay in advance for your dinner. Dinner and ticket information as outlined below:

Menu

Salad Bar
Swiss Steak
Chicken Supreme
Red-skin potatoes
Green beans almondine
Bread, butter
Beverage
Dessert Table

No-host bar 6:00 to 7:00 P.M.
Dinner served at 7:00 P.M.

Ticket Info

Betsy Townsend, WV7Y
P.O. Box 644
Spokane, WA 99210
(509) 534-4822

Make checks payable for $23.00 per dinner to Betsy Townsend. Sorry no credit cards can be accepted.

Each year this dinner has gained popularity. You won't want to miss this event. *Order your tickets today!* After dinner we will enjoy a short program. Your MC this year - Jim Mortensen, N2HOS

TCP/IP, Wormholes

and the Internet

by Joe Kasser, W3/G3ZCZ • POB 3419 • Silver Spring, MD 20918
Tel: (301) 593-6136 / Fax: (301) 593-2624

This article has been condensed from Basic Packet Radio, second Edition 1994, published by Software for Amateur Radio, POB 3419, Silver Spring, MD 20918, and is published herein with permission.

These days, the bulk of amateur packet radio uses the AX.25 protocol. An up and coming alternative is Transmission Control Protocol/Internet Protocol (TCP/IP). TCP/IP is an adaptation to amateur radio of the TCP/IP protocols used on wired networks such as the Internet. TCP/IP offers three basic features, MAIL, File Transfer Protocol (FTP) and TELNET. MAIL is a message store and forward facility almost identical to the standard PBBS. FTP is a facility that allows ASCII and Binary files to be transferred between stations. TELNET provides the capability for one station to remotely "log on" to a second station and operate the computer as a remote user.

TCP/IP assigns each user a unique 32 bit number usually expressed in the form 44.86.73.88. The TCP/IP number identifies both the LAN and the user. Amateur Radio has been recognized as a legitimate TCP/IP and assigned a network or domain identification. All amateur radio TCP/IP numbers begin with "44". Amateur radio (and packet radio) identify users by callsigns. Amateurs using TCP/IP need both their callsign and a TCP/IP number. These "amateur TCP/IP identification numbers" are available from local TCP/IP groups.

Since, at this time, most of amateur packet radio is at 1200 baud, TCP/IP has very little, if anything, to offer, that regular packet radio has not. Documentation is scarce and not very user friendly. *It is not worth investing time in it, unless you want to experiment for the sake of experimenting and learning.* However, the probability is high, that as packet radio evolves and starts to work at higher baud rates, TCP/IP or the then current commercial protocol will be adopted into amateur packet radio.

TCP/IP and AX.25 protocols are not compatible, so you can't use LAN-LINK or an other terminal program designed for AX.25 to communicate directly with stations using TCP/IP. That does not mean to say don't make use of it. The best way to take advantage of the capabilities of TCP/IP as a user is to make use of one of the hybrid TCP/IP-AX.25 PBBSs and gateways since they provide both PBBS and Node services at the same time, and in more and more cases real-time wormholes to other parts of the world. These systems will be referred to as 'hosts'.

The NOS Host

These Network Operating System (NOS) Hosts have been developed from C language Software first produced by Phil Karn, KA9Q, and since modified by PA0GRI and others. The version described herein is the one modified and distributed by Johan Reinalda, WG7J/PA3DIS. These hosts have the ability to act as a Node, a PBBS and a conference hub all at the same time, and development is ongoing by a whole group of people. Each version you see on the air may be slightly different, and not all features may be enabled at any one time. In other words, some of the commands may not work for you. It is also likely that new features may have been added by the time you read this. Watch the prompt line for an idea of which commands are enabled. The "IH" and "IP" commands show up on TCP/IP style Nodes. As with other types of PBBS, you can get a brief help listing by using the "?" command. If you need more information, type "?" followed by the command letter you need more information about. As a user, you may note two major differences between the NOS host approach and the (what has become conventional) approach. They are:

- Individual/Bulletin Areas
- Built-in Nodes

The NOS host sorts and stores messages in personal and public file areas. You can access all public file areas and your own personal user area. This means if you send a message to another user, the message goes into his/her area, and if you change your mind you can't delete it later. So think before you send.

The sorting process means that you cannot ask the host for a list of all new bulletins in a single command. You must identify the areas and access each area of interest in turn, and then ask for a list of new bulletins in that area. Use the "A" command to change areas. If you use the "A" command you will receive a list of the mail areas you can access. The "A" command on its own, gets you a short listing, whereas "AF" will get you a full listing with descriptions (if available). You can send (post) mail to any of the listed areas by using the command "S areaname".

The host remembers which messages and bulletins you have read, and the next time you change to an area, the "L" command will only list messages newer than the last one previously listed.

You send messages or bulletins using variations of the "S" command. If you want to reply to a message (in real-time, while logged on, or off-line) use the "SR" command. Use "SR" to reply to the current message while on-line, and (better) "SR #" to reply to message number # (where # is the message number). The subject of the message will be copied and the reply will be sent to the address the message was received from. Use the "SF" command to forward a copy of the current message to another person.

If you want to send copies of a message to more than one person, use the "SC" command. A typical example of the dialogue goes something like the one shown in Figure 1. Continue to send the text of the message in the usual manner. You may send copies of the message to several people as long as you put a comma between calls.

Figure 1 Command Dialogue for Sending Copies of Messages

```
You type:                "SC GM4IHJ@GB7SAN"
The system replies: "Cc:"
You type:                "G3IOR@GB7LDI,G3ZCZ@WA3NAN"
The system replies: "Subject:"
```

NOS is a multi-tasking system. It is arranged in sessions. Each task each user initiates is considered as a session.

The 'escape' character allows you to abort a session. For example, if you attempt to connect to a distant host, and get no response within a minute or two, you can send the 'escape' character, followed by the 'Enter' key and the session will be terminated and you will receive the regular prompt line. This feature is also useful when connecting through several hosts in series. If you change the 'escape' character on each host, you can abort a session on one, without interfering with any sessions on those hosts between you and the one you are currently logged in on.

Use the command "E" to examine or change the 'escape' character. The "E" command, when entered by itself, will show the character that is currently set as the escape character. You change the 'escape' character by entering "E" followed by a space and the character that

Figure 2 Node Listing from WA3NAN Showing Wormhole Nodes

```
#temp:F6CNB-1    #temp:VK3COL-2   #DOY48:VK2DOM-2  #DOY51:VK2XDM-14
#GWXSB:VK2XSB-9  #PRG3:N8KHN-13   1E0214:KI5OH      1E021E:KB5SQG
2DAYIP:VK2DAY    4C0541:KG5RG-2   4C0589:F6CNB-8    96GATE:WH6AQ
9C010D:HA5KFU-5  ACT:VK1BUD-5     AJQ_GW:VK3AJQ     ALEXBB:KN4ZG
ANNBBS:KA3RFE    ARMDLE:VK2DJG    BALTO:W3GXT-5     BBSBBS:VK3BBS
BBSBLW:VK3BLW    BBSHRG:N4WJN     BBSNOD:VK3BBS-2   BBVQA:W4VQA      BLWIP:VK3BLW-1   BLWNDE:VK3BLW-2  BOWR48:VK2XDM-2
BRADIP:WB9UUS    BRADXX:WB9UUS-2  CALVRT:W4OKW-3    CCOAST:VK2RAG    CHAVER:N3BBF     CNBBPQ:F6CNB     DCA1:K3AF-1
DELTA:VE7ROB-3   DUNDAS:VK2JNT-1  DXVIC:VE7VIC-9    DXWHO:VE7CC-3    EDUBBS:PP5UF-8   EHQBBS:VK2EHQ    EWABBS:KB3RM
EZF:KC4ASF-3     EZFBB:KC4ASF-1   FARA:N4YXW-7      FEXBBS:VK2FEX    FEXIP:VK2FEX-1   FEXNOD:VK2FEX-2  FMNET:WA4FRB-10
GCDXC:AB5A       GIN48:VK1RGI     GLSBPQ:KG5RG-3    HAISIP:VK3ERM-3  HGN:W3BRZ-9      HNL:KJ9U         HOCOBB:NB3P
HOLD2:VK3RPS     HOLD70:VK3RPS-7  HOUBPQ:WA4IMZ-2   IBMNOD:VK3IBM-2  ILBRAD:WB9UUS-6  ILPIA5:W9JWC-5   ILTEST:N9LVI-5
IMS:KA3LXE-8     IUBBS:K9IU       IXSWIT:VK3IX-1    JNTSW:VK2JNT-9   JPLARC:W6VIO-5   JPLGW:W6VIO-14   KCMIP:VK1KCM-2
KCMNOD:VK1KCM-1  KDBBS:KE7KD-10   KDNODE:KE7KD-1    LCBBS:K5DI       LCOQSO:N3JOZ-6   LION:N7XBM-2     LRNET:WA4FRB-9
LURNEA:VK2XFW-2  MACUNI:VK2TJF-5  MANAS:N4WJN-5     MBGBBS:KB8NIO    MELAUS:VK3RUM    MEMIP:N9GSA-2    MRB2:WA8FSE-2
MRB4:WA8FSE-4    MRB:WA8FSE       MRBCON:WA8FSE-1   MTSBG:KB8NIO-4   MTSUIP:W4EFQ-1   NCLE:VK2RAP      NEWC2:VK2RPN
NMSUGW:W5GB-9    OLUOLU:KH6TZ     OVH:WA4FPM        PAX1:W4OKW-1     PCVAN:VE7CQD     PMILLS:N4LJZ-4   PUNAHO:NH6QZ-1
REDH2:VK3RPK     REDH70:VK3RPK-7  RENONV:N8KHN-2    RESTON:N4ULS-5   RGR:VE7RGR-4     ROBBBS:VE7ROB    RTY:VE7RTY-3
RTYBBS:VE7RTY    RYDE:VK2YME      RYEHAM:VE3RPI     SATGAT:VK2XGJ    SFTN:N3JOZ-4     SFU:VE7SFU       SYDBBS:VK2XSB
SYDIP:VK2XSB-5   SYDNEY:VK2RVT    SYDNTH:VK2RMB     SYDSW:VK2XSB-2   USCG:K4CG-5      VHF:VE7VHF       WALCHA:VK2TBU
WASHDC:N3BBF-3   WOLGNG:VK2XGJ-1  WORM:K2CC-2       XDMSYS:VK2XDM    YVR71:VE7VHF-3   ZDJGTE:VK1ZDJ-2
```

you want to become the new 'escape' character. It must be a single typed character. For example:

"E ^Z" changes the 'escape' character to ^Z.

"E X" changes the 'escape' character to the letter 'X'.

Using Wormholes

To the user, a wormhole appears just like any other Node, and is used as such. The only difference is what lies at the other end of the link. When I connect to the WA3NAN host on my side of the wormhole the world opens up. A typical example of the Nodes I was able to access is shown in Figure 2. At first glance, it looks like a local listing. Look again, some of the calls begin with the VK2, VK3, KH6, VE7 as well as prefixes from all over the USA.

Exploring Wormhole Links

Before you can explore the links, you have to find out how each host is linked with other hosts. The "P" command provides a list of ports on the host, along with a description if one has been setup for that port. Any Internet ports are 'virtual' ports on the same hardware interface and are named by the system operator. consequently, the same link might have different names at each end of the link.

You can explore the local activity using some of the Node commands, the other commands deal with Node or message store and forward functions. I used the "C JPLARC" command to connect to the JPLARC Node and received the results shown in Figure 3. A painless real-time link across the USA from the Washington DC. area to the Los Angeles area. I requested a list of Nodes, saw a node listed in the New York City area and connected to it. Once more, I asked for a list of Nodes, and saw one from my home town of London (BIGBEN:G7HNK) listed. I attempted a connect request and received the response shown in Figure 4.

The "P" command is very useful in building maps of links between hosts to determine the shortest path to a distant host, or for plain exploring. Each host is connected to different hosts. If you connect to each hosts, and use the "P" command, you will quickly get a picture of which host is directly connected to which other host. The system is growing and evolving.

Figure 3 Typical Host Connection Dialogue

```
Trying... The escape character is: CTRL-T
*** connected to JPLARC:W6VIO-5
Welcome to the W6VIO Packet Switch at NASA/Jet Propulsion Laboratory
Pasadena, California.
Type ? for list of available commands.
```

Figure 4 A Different Host Connection Dialogue

```
NYCITY:WA2NDV-2} Connected to BIGBEN:G7HNK

Welcome g3zcz,
to the G7HNK TCP/IP Mailbox (911229 (WG7J v1.09 (N2MH 930712)-8088))
Currently 4 user(s)

        NBC WORLD WIDE CONFERENCE BRIDGE
        ================================
       (44.131.7.146)

 Type C to Logon then /h for help or /w to see who is connected
 If you wish to use telnet/ftp you will need to register. Leave
 a msg for G4NQO at GB7HSN stating callsign and password.
 Registered users may like to download UK.MAP and SYSTEM.MAP
 Just type d followed by either of the above file names.

UK PLEASE avoid the QSO(N2MH) node as you may jam the conv link
                              73 de G7HNK & G4NQO

Current msg# 0. ?,B,C,H,I,IH,IP,J,M,N,NR,X >
```

In December 1993, I explored a small part of the wormhole universe with the results described below. I connected to W6VIO and received the response to the "P" command shown in Figure

(cont'd on page 12)

(TCP/IP - cont'd from page 11)

Figure 5 The Ports at W6VIO in December 1993

```
Available ports:
brazil :  NET/ROM Link to Santa Catarina,
          Brazil 'EDUBBS:PP5UF-8'
brisbe :  NET/ROM Link to Brisbane, SE Queensland, Australia
          'BRISGW: vk4kiv-14'
hawaii :  NET/ROM Link to Univ. of Hawaii - 'OLULU:kh6tz'
utah   :  AX25 Link to Univ. of Utah - Salt Lake City, Utah
          'wa7slg-3'
moscow :  AX25 Link to Moscow, Russia - 'ra3apw-7'
texas  :  NET/ROM Link to Houston, Texas - '4c0589:f6cnb-8'
gsfc   :  NET/ROM Link to NASA / GSFC - 'GARC:wa3nan-9'
canber :  NET/ROM Link to Canberra, Australia - 'ACT:vk1bud-5'
buda   :  AX25 Link to Budapest, Hungary - 'ha5kfu-1'
ttyb
ttya   :  JPLGW <--> JPLARC <--> Los Angeles, California USA

JPLGW:W6VIO-14 Area: g3zcz Current msg# 0.
?,A,B,C,D,E,F,H,I,IH,IP,J,K,L,M,N,NR,P,R,S,T,U,V,W,X,Z >
```

5. I then connected to KH6TZ in Hawai, and using the "P" command received the response shown in Figure 6. I tried to connect to the host in Moscow. I received the response shown in

Figure 6 The Ports at KH6TZ in December 1993

```
Available ports:
gb     :  Las Cruces, NMSUGW, NETROM w5gb-9
uf     :  Santa Catarina, NETROM pp5uf
erm    :  Melbourne area, NETROM vk3erm-2
rvt    :  Sydney, NETROM vk2rvt
sfu    :  Vancouver, NETROM ve7sfu
khn    :  Nevada, NETROM n8khn-2
cnb    :  Houston, NETROM f6cnb-8, mail route
uus    :  Illinois, NETROM wb9uus
imo    :  Grand Rapids, MI, NETROM n8imo-4
cc     :  Clarkson U., NETROM k2cc-2
iu     :  Indiana University, k9iu-6
gsa    :  Memphis State U., NETROM n9gsa-2
vio    :  Los Angeles, JPL ARC, NETROM w6vio-14
nan    :  Goddard Space Flight Center ARC, NETROM wa3nan-9
ax2    :  Aikane experimental port
ax1    :  147.34 MHz +600 duplex at 9600 baud
ax0    :  145.090 MHz simplex at 1200 baud

OLUOLU:KH6TZ - Area:g3zcz - Msg# 0.
?,A,B,C,D,E,F,H,I,IH,IP,J,K,L,M,N,NR,O,P,R,S,T,U,V,W,X,Z >
```

Figure 7. Not bad, a real-time packet link from Silver Spring, MD. to Moscow via Los Angeles. I tried the "P" command to see where the Moscow host was connected, and received a similar response which showed some redundant or duplicate links, and a new one to Poland. Still exploring, I connected to Krakow and sent a "P" command and found other hosts including one or two new hosts. For example, I noticed a link between VK2RAP in Australia and HB9AB in Switzerland.

Looking at the responses to the "P" command from the different hosts is similar to looking at an AX.25 Node map of 10 years ago. Each host has direct connections to a limited number of other hosts. For example, Moscow has two direct links to the USA, one to Hungary and one to Poland. California, on the other hand, has several stateside links, a link to Australia, and the one link to Hungary.

Figure 7 The Connection Dialogue to Moscow

```
Trying... The escape character is: CTRL-T
*** connected to RA3APW-7
[JNOS-1.10x9-HM$]

Welcome g3zcz,
to the RA3APW-7 TCP/IP Mailbox (JNOS 1.10x9 (80186)).
Currently 2 users.

If you want have more access on this system pse send a message to
sysop (type "s sysop") and leave the word for password.

You have 0 messages.

Please type 'REGISTER' at the > prompt.
Area: g3zcz Current msg# 0.
?,A,B,C,D,E,F,H,I,IH,IP,J,K,L,M,O,P,R,S,T,U,V,W,X,Z >
```

The "IP" and "IH" commands provide you with information about what TCP/IP systems the host is hearing on its input/output channels.

The "J" command will get you a list of all the station callsigns that have been monitored. It tells you the port the station was heard on, the elapsed time since the station was heard last, and the total number of packets received. When the command is used alone (no port specified), the list for all the ports will be provided. If the system has been up for some time, and the channels are very active, this list could become very long. A typical response to the "J" command is shown in Figure 8.

You can check out who is using a host with the "M" command. For example, while connected to SP9KBY-10 the typical response to the "M" was as shown in Figure 9. The users appear to be both TCP/IP and AX.25.

Hosts provide extensions to the Node commands which give you more information about both the quality of the link, and the number of routes a host has to other hosts. Each command starts with the letter 'N'. The "NR" command gets you a list of neighbor Nodes on each port of the host. A typical response to the "NR" command is shown in Figure 10.

The '>' in the first column of the line indicates that the route has been used within the past 60 seconds. The higher the number in the path quality, the better. The number of destinations shows you how many Nodes the host knows about on that port, and the obsolescence counter tell you something about the reliability of the link.

If you want to know something about the path or paths to another host Node, use the "N host" command. For example, while connected to VE7SFU, I sent the "N worm" command to ask for the paths to the WORM:K2CC-2 host in the New York area. The response received is shown in Figure 11.

If you want to check out all paths use the "N *" command. It will probably provide you with more than you want to know about the path and quality of each route as shown in Figure 12 in the extract of a typical response. Several paths to different Nodes are shown. It is interesting in that the direct paths from the west coast of the USA. to New York seem to be via Hawaii or Brazil. In the world of wormholes, distance seems to have little relevance to connectivity. Use the "P" and "N" commands and explore the wormhole universe.

Real-time Global Round Table QSOs

These hosts feature a conference mode which provide a real-time round table QSO to anyone who can get access. For example, I asked the system to send me a list of who was connected

Figure 8 Typical Host Responses to the "J" Command

```
Interface  Station    Time since send  Pkts sent
newmex     RA3APW-12      0:00:05:10         45
Station    Time since heard Pkts rcvd : Station    Time since heard Pkts rcvd
MOSCOW          0:00:01:47          5  : RA3APW-12       0:00:05:10          10
UZ3AXX-15       0:00:35:25         35  : W5GB-9          0:00:40:18          19
Interface  Station    Time since send  Pkts sent
hun        RA3APW-11      0:00:05:10         15
Station    Time since heard Pkts rcvd : Station    Time since heard Pkts rcvd
RA3APW-11       0:00:05:10         10  : UZ3AXX-15       0:00:32:19           5
Interface  Station    Time since send  Pkts sent
krakow     RA3APW-10      0:00:05:10         10
Station    Time since heard Pkts rcvd : Station    Time since heard Pkts rcvd
RA3APW-10       0:00:05:10         10
Interface  Station    Time since send  Pkts sent
calif      RA3APW-9       0:00:00:00         54
Station    Time since heard Pkts rcvd : Station    Time since heard Pkts rcvd
RA3APW-7        0:00:00:00         35  : G3ZCZ-15        0:00:00:00          37
RA3APW-9        0:00:05:10         10  : UZ3AXX-15       0:00:34:11           9
W6VIO-14        0:00:52:45          3
Interface  Station    Time since send  Pkts sent
ax0        RA3APW-7       0:00:05:10        157
Station    Time since heard Pkts rcvd : Station    Time since heard Pkts rcvd
RA3APW-7        0:00:05:10        152  : UA3CR-11        0:00:06:17          12
RA3APW          0:00:20:10          1  : UZ3AXX          0:00:30:14          48
Area: g3zcz Current msg# 0.
?,A,B,C,D,E,F,H,I,IH,IP,J,K,L,M,O,P,R,S,T,U,V,W,X,Z >
```

Figure 9 Typical Set of Users on the Kracow Host

```
Users:
Uplink (SP9FBT on port vhf) <--> Telnet   (44.136.8.106:telnet)
Uplink (SP9SVH on port vhf) <--> Downlink (SP9QMA on port vhf)
Telnet (g3zcz @ 192.86.22.18)       -> Idle
Telnet (ve3gop @ 128.100.8.3)       -> Idle

Area: g3zcz Current msg# 0.
?,A,B,C,D,E,F,H,I,IH,IP,J,K,L,M,O,P,R,S,T,U,V,W,X,Z >
```

Figure 10 Typical Response to the "NR" command

```
Routes :
  Neighbour          Port   Qual Obs Dest Tries Retries Perc Irtt
  OLUOLU:KH          hawaii 201  4   30 11    1       91 %
  JPLARC:W6VIO-5(BPQ) ttya 255  6    1 497   9       98 % 180
  EDUBBS:PP5UF-8     brazil 230  6    8 13    1       92 %
  4C0589:F6CNB-8     texas  230  5    4 0     0        0 %
    GARC:WA3NAN-9    qsfc   240  6    1 0     0        0 %
  JPLBBS:W6VIO-1(BPQ) ttya  50  6    1 42    0      100 %

JPLGW:W6VIO-14 Area: g3zcz Current msg# 0.
?,A,B,C,D,E,F,H,I,IH,IP,J,K,L,M,N,NR,P,R,S,T,U,V,W,X,Z >
```

Figure 11 Typical Response to the "N worm" command

```
Node          Neighbour       Port   Qual Obs Type Usage Hops Irtt
WORM:K2CC-2 EDUBBS:PP5UF-8 brazil 163   6  B    0
            OLUOLU:KH6TZ   hawaii 207   6  B    0

Area: g3zcz Current msg# 0.
?,A,B,C,D,E,F,H,I,IH,IP,J,K,L,M,N,NR,O,P,R,S,T,U,V,W,X,Z >
```

and a sample of the variety of hosts and calls listed in the response is shown in Figure 13.

Other information is provided as well as the calls of the stations connected to the system. Anyone who wants to hold a somewhat private conversation can pick an empty channel and move to it. Everyone is connected to channel 0 when logging on to the conference mode. When connected, the dialogue on-screen looks like the example shown in Figure 14.

Accessing the Internet

NOS, being TCP/IP based, has the capability for real-time Internet links. Any station who has Internet connectivity on the PC and the capability to connect a TNC and radio at the same time, can use the host software to provide a Node as well as a PBBS, and this capacity includes acting as an Internet wormhole. The "T" command allows you to initiate a TCP connection from the host you are connected with, out across the network to another host. This TELNET feature has the capability to allow a radio amateur AX.25 packeteer to gain access to the TCP/IP network (and the Internet). This command should normally be disabled.

Mail to and from the Internet

Message transfers in each direction at the gateway are technically possible at this time as shown in Figure 15 by the listing of incoming bulletins. Legal issues however, have to be considered regarding the content of those messages. Messages that came via the internet can be recognized by the "strange" entries in the callsign fields. If your host is on the Internet, then with the agreement and permission of the system operator, you can receive Internet messages and bulletins. If you desire the capability to send messages, contact the system operator.

Figure 12 Edited Typical Response to the "N *" Command

```
4C0541:KG5RG-2          194   5 hawaii   KH6TZ     B 0
4C0541:KG5RG-2          216   6 texas    F6CNB-8   B 0
4C0589:F6CNB-8          181   5 brazil   PP5UF-8   B 0
4C0589:F6CNB-8          207   5 hawaii   KH6TZ     B 0
4C0589:F6CNB-8          230   6 texas    F6CNB-8   B 0
JPLARC:W6VIO-5  (BPQ)   255   6 ttya     W6VIO-5   P 497      1
JPLBBS:W6VIO-1  (BPQ)    50   6 ttya     W6VIO-1   P 5        1
SEFTON:VK2RG            181   5 hawaii   KH6TZ     B 11
SFU:VE7SFU              181   5 brazil   PP5UF-8   B 0
SFU:VE7SFU              207   5 hawaii   KH6TZ     B 0
WORM:K2CC-2             181   5 brazil   PP5UF-8   B 0
WORM:K2CC-2             207   5 hawaii   KH6TZ     B 0
JPLGW:W6VIO-14 Area: g3zcz Current msg# 0.
?,A,B,C,D,E,F,H,I,IH,IP,J,K,L,M,N,NR,P,R,S,T,U,V,W,X,Z >
```

Figure 13 Typical Participants in a Global Round Table

User	Host	Via	Channel	Time	Personal
ka1of	W_Haven,Ct	OzHub	0	6:38	
oh6bc	Vasa	OzHub	0	6:37	
wb6dlg	SaltLake	OzHub	0	6:36	
ve3kyz	Brantford	OzHub	0	6:33	
ke8mk	Detroit	OzHub	5	6:09	
g3zcz	Oahu		0	6:08	
pa3gfq	holland	OzHub	0	6:08	
kj1y	reno	OzHub	0	6:06	
om3twn	Budapest	OzHub	0	6:02	
wb7spd	Detroit_MI	OzHub	69	6:00	
hg5bf1	Budapest	OzHub	0	6:00	
wb8wka	FarmngtnMI	OzHub	69	5:55	
hg5ciq	Budapest	OzHub	0	5:51	
pelnmb	maassluis	OzHub	73	5:49	
k5kqg	Ottawa	OzHub	0	5:48	
db4rc	ijmond	OzHub	0	5:46	
kb8po	Detroit_MI	OzHub	69	5:44	
pa0spz	westland	OzHub	73	5:33	
on1ajz	westland	OzHub	0	5:33	
kd9su	Detroit	OzHub	39	5:30	

(cont'd on page 26)

Contesting

Coming Events and Awards

by Rich Lawton, N6GG • 14395 Bevers Way • Pioneer, CA 95666

RTTY Contests - Coming Events

Date:	Contest:		
FEB 4-5	ADRS WW RTTY WPX	(USA)	<<—NEW!
FEB 18-19	DARC HF RTTY Part I		(German)
MAR 5	DARC CORONA 10M Digital		(German)
MAR 18-19	BARTG Spring RTTY		(British)
APR 1-2	EA WW RTTY		(Spanish)

NOTE: The EA WW RTTY Contest has been moved from the 2nd weekend in February to the 1st weekend in April.

— — REMINDERS: — —

ARRL RTTY Roundup (January '95) log entries must be postmarked no later that 30 days after the end of the contest (February 7, 1995). Mail entry (logs or disk) to:
ARRL RTTY ROUNDUP
225 MAIN ST
NEWINGTON CT 06111

ADRS WW Digital WPX (February '95) log entries must be postmarked no later than 30 days after the end of the contest (March 7, 1995). Mail entry (logs or disk) to:
JAY TOWNSEND, WS7I
BOX 644
SPOKANE, WA 99210-0644
-or- via Internet: jayt@comtch.iea.com

— — COMING UP: — —

AMERICAN DIGITAL RADIO SOCIETY
announces
The First Annual ADRS World-Wide Digital WPX Contest
On the first full weekend of February each year

Starts: 0000 UTC Saturday- Ends 2400 UTC Sunday

I. CONTEST PERIOD: Only 30 hours of the 48 hour contest period is permitted for Single Operator and Multi-single operator stations. Off periods must be a minimum of 60 minutes in length and be clearly marked in the log. Multi-multi operator stations may operate the full 48 hours.

II. OBJECTIVE: The object of the contest is for amateurs around the world to contact as many amateurs in other parts of the world as possible during the contest while using a digital mode. **RTTY, Amtor, Pactor, G-Tor, and Clover** are all welcome. No cross-mode QSO's are allowed.

III. BANDS: 3.5, 7, 14, 21, and 28 MHz. No WARC bands.

IV. CATEGORIES:

SINGLE OPERATOR (Single Band or All Band, Low or High Power). Single operator stations are those at which one person performs all of the operating and logging functions. **(DX Packet Clusters, and DX alerting assistance is permitted.)**

1. Single Operator HIGH POWER:
Output power more than 150 watts. Stations in this category will compete with other high power, single operator stations only.
a) All bands.
b) Single band.

2. Single Operator, LOW POWER:
Output power is less than 150 watts. Stations in this category will compete with other low power, single operator stations only.
a) All bands.
NOTE: There is no single operator, low power, single band category.

MULT-OPERATOR (All band operation only, no power classes)

3. Multi-Operator:
a) **Single Transmitter:** Only one transmitter and one band permitted during the same time period (defined as 10 minutes).
b) **Multi-transmitter:** No limit to number of transmitters, but only one signal and running station allowed per band. NOTE: All transmitters must be located within a 500 meter diameter or within property limits of the station licensee's address, which ever is greater. All antennas must be physically connected by wires to the transmitters and receivers.

EXCHANGE: RST report plus a progressive three digit QSO number, starting with 001.
(Continue to four digits if past 1000) Multi-transmitter stations will use separate number sets for each band.

VI. POINTS:

A. Contacts between stations on different continents are worth three (3) points on 28, 21, 14, and six (6) points on 7 and 3.5 MHz.

B. Contacts between stations on the same continent but in different countries are worth two (2) points on 28, 21, and 14 MHz, and four (4) points on 7, and 3.5 MHz.

C. Contacts between stations in the same country are worth one (1) point on 28, 21, and 14 MHz, and two (2) points on 3.5 and 7 MHz.

VII. MULTIPLIERS: The multiplier is the number of different prefixes worked. A "PREFIX" is counted only once, regardless of the number of times the same prefix is worked.

A. The letter/number combination which form the first part of the amateur call will be considered the prefix. **EXAMPLES:** N8, W8, WD8, Y22, Y23, HG1, HG19, WB2, WD200, KC2, KC200, OEE2, OE25, U3, GB75, ZS66, NG84, etc.. Any difference in the numbering, lettering, or order of same shall constitute a separate prefix.

A station operating from a DXCC country different from that indicated by its' callsign is required to sign portable. The portable prefix must be an authorized prefix for the country or call area of operation. In case of portable operation, the portable designator would then become the prefix. **EXAMPLES:** AB5KD operating from Wake Island would sign AB5KD/KH9, or KH9/AB5KD. KH6XXX operating from Ohio would not sign /KH8 (prefix of American Samoa), but would sign /W8, /N8, /K8, etc., or any other prefix authorized for use in the USA 8th district. Portable designators without numbers will be assigned a zero (0) after the second letter of the designator to form the prefix. WS7I/PA would become PA0. All calls without numbers will be assigned a zero (0) after the first two letters to form the prefix. **EXAMPLE:** XEFTJW would count as XE0, RAEM would count as RA0, etc.. The following do NOT count as prefixes: Maritime mobile, /A, /E, /J, /P, or interim license class identifiers.

B. Special event, commemorative, and other unique prefix stations are encouraged to participate.

VIII. SCORING:

1. **SINGLE OPERATOR:**
a) All Band score: total of QSO points from all bands multiplied by the number of prefixes worked.
b) Single Band score: QSO points on the band multiplied by the number of different Prefixes worked. (See VII)

2. **MULTI-OPERATOR:** Scoring in both of these categories is the same as the All Band scoring for Single Operator.

3. A station may be worked once on each band for QSO point credit. However, PREFIX CREDIT CAN BE TAKEN ONLY ONCE, regardless of the number of different bands on which the same station and/or prefix has been worked during the entire contest.

IX. LOW POWER SECTION: (Single Operator only) Output must not exceed 150 watts. You must indicate "Low Power" on the Summary.

X. AWARDS: Certificates will be awarded to the highest scoring station in each category listed under Section IV, in: a) Every participating country, and b) In each call area of USA, Canada, Australia, and Japan.

3. All scores will be published. However, to be eligible for an award, a Single Operator station must show a minimum operating time of 12 hours. Multi-operator stations must show a minimum of 18 hours. A Single Band entry is eligible for a single award ONLY. If a log contains more than one band, it will be judged as an all band entry, unless specified otherwise.

XI. TROPHIES, PLAQUES and DONORS:

Multi-Multi
WORLD ————Kantronics Inc.
N.AMERICA——John Troost, TG9VT Memorial (by W2JGR)
EUROPE————Eastern Washington Amateur Radio Group

ASIA————George Clausson, K7WUW
S.AMERICA——George Wesley, KB2VO

Multi-Single
WORLD————Advanced Electronics Applications, Inc.
USA————RTTY by WF1B
N.AMERICA——Phil Duff, NA4M
S.AMERICA——ADRS Directors Plaque
EUROPE————Jim Mortensen, N2HOS
ASIA————Ted Marks, W2FG

Single Operator, All Band (High Power)
WORLD————Ron Stailey, AB5KD
USA————Irv Hoff W6FFC Memorial (by WA7FAB)
N. AMERICA—Hal Communications, Corp.
S. AMERICA—Pat Cardozo, HH2PK
OCEANIA————Shido Takahashi, AH6JF
AFRICA————Euraf Communications, Benin
EUROPE————Bill Hellman, NA2M
ASIA————Jim Colville, WB7AVD

Single Operator, All Band (Low Power)
WORLD———— Rich Lawton, N6GG
USA———— Don Hill, AA5AU
N. AMERICA—Ron Hall, KP2N
S. AMERICA—Warren Sinsheimer, W2NRE
OCEANIA————Wayne Matlock, WA6VZI
AFRICA————John Lockhart,WA0VQR
EUROPE————Eddie Schneider, W6/G0AZT
ASIA————Hal Blegen, WA7EGA

Single Operator - Single Band
WORLD 10 MTR—Robert Chudek, K0RC
WORLD 15 MTR—Washington Educational Foundation (by WS7I)
WORLD 20 MTR—Les Bannon, WF5E
WORLD 40 MTR—Barry Kutner, W2UP
WORLD 80 MTR—Tom Arvo, WA8DXD

XII. LOG INSTRUCTIONS:

1. All times must be in UTC. All rest periods must be clearly marked. Single Operator logs must be submitted in chronological order. Multi-Multi logs must be submitted chronologically by band. Multi-Single can be submitted either way.

2. Prefix multipliers should be entered only the FIRST TIME they are contacted and must be clearly designated.

3. Logs must be checked for duplicate QSOs, correct points, and prefix multipliers. Duplicate contacts must be clearly shown.

4. An alpha/numeric check list of claimed PREFIX multipliers must be submitted with log.

5. Each entry must have a Summary Sheet, listing all scoring information, category of competition, and the contestant's name and address in BLOCK LETTERS. NOTE: Also submit a declaration that all contest rules and regulations for amateur radio in the country of the contestant have been observed.

6. Official logs and sample summary sheets are available from ADRS. A large self-addressed envelope with sufficient postage or IRC's must accompany your request. Contest software by WF1B will be available for the first contest.

7. Contest logs may be submitted on disk, E-Mail, or Internet. Logs submitted on disk must contain all required information. (DATE, BAND, TIME, CALLSIGN, RST and QSO # SENT, RST and QSO # RECEIVED, NEW PREFIX (Multiplier), and QSO POINTS. Files must be in ASCII format and in chronological order for Single Operators and Multi-Single entrants. Multi-Multi entrants must submit logs chronological by band. A sorted multiplier file is also required. Only MS-DOS compatible disks will be accepted (either 5+ or 3+ inch). A summary sheet must accompany the data, showing all required scoring information, the category of competition, off times, and the normal declaration, as well as your name and address. A SASE with QSL card will get a reply that your log has been received.

XIII. DISQUALIFICATION: Violations of amateur radio regulations in the country of the contestant, or the rules of the contest, unsportsman-like conduct, taking credit for excessive QSOs, non-verifiable QSOs, or multipliers will be deemed sufficient cause for disqualification. (Incorrectly logged calls will be counted as non-verifiable contacts.) An entrant whose log is deemed by the Contest Committee to contain a large number of errors may be disqualified.

X1V. DEADLINE: Entries must be postmarked no later than thirty (30) days after the end of the contest.The ADRS World Wide Digital WPX Contest will always be on the first full weekend of February.

Mail Contest Entry and logs or disks to:

Jay Townsend, WS7I
P.O. Box 644
Spokane, WA 99210-0644 U.S.A.
-or- via Internet: jayt@comtch.iea.com

For ADRS WPX rules, logforms, or information, contact:
Ron Stailey, AB5KD
504 Dove Haven Drive
Round Rock, TX 78664-5926
-or- via Internet: ron481@austin.relay.ucm.org

COMMENTS: Here's a brand new contest! It's patterned after the CQ WW CW/SSB WPX but with some subtle changes. And it happens when conditions should be really hot.

NOTE: The same station may be worked on different bands for QSO points, but there are NO band multipliers. However, there are double QSO point bonuses for lower band operating (80 and 40M), which should keep you band-hopping all night long!

The simple exchange (RST + QSO number) means the QSO rates will be very high. And it also gives you a way to keep track of your competition by comparing your serial number to his.

Since 10M will most likely be dead, and 80 and 40M will be alive at night, try to plan your 30 hours of rest periods for mid-day, after you've depleted 20 and 15, ha!

Notice the number of certificates and awards in each category - and that there is a low power category, too. Just about everyone has a chance to win something.

DARC HF RTTY Contest

February 18 -19, 1995 - Part I.

Sponsored by Deutscher Amateur-Radio-Club e.V. (DARC)

CONTEST PERIOD: Part I: Third full weekend in February (FEB 18-19, 1995)
Part II: Third full weekend in July (JUL 15-16, 1995)
Segment A: Saturday: on 20, 15, and 10M: from 1000Z to 1600Z (6 hours)
Segment B: Sunday: on 80 and 40M: from 1400Z to 2000Z (6 hours)

MODE: RTTY (Baudot) only

BANDS: 80, 40, 20, 15, and 10M

CLASSES: A - Single op B - Multi-op C - SWL

EXCHANGE: USA stations: send RST + QSO nr. + name + State
All others : send RST + QSO nr. + name

MULTIPLIERS: Each DXCC/WAE country, and each USA state, and each call district in JA, VE, and VK, (NOT USA), regardless of band. (NO band multipliers) For USA stations, count only the FIRST QSO with a USA station as a DXCC/WAE country multiplier, regardless of band.

QSO POINTS: Count 1 point for QSO with own country. (States of USA are not counted as countries)
Count 2 points for QSO outside your country but within continent.
Count 3 points for QSO outside your own continent.

FINAL SCORE: Total QSO points x total of multipliers.

AWARDS: To top stations in each class, country and district mentioned above.

LOGS: Logs must contain: Date, Time UTC, Callsign, Message sent/received, name, US-State, first-time-multiplier, and QSO points. Also required is a Summary sheet with a list of claimed multipliers. If entry is multi-op, please list names and callsigns of all ops. Comments are very much appreciated.

DEADLINES: Part I: May 1, 1995. Part II: September 1, 1995. Mail entry to:

Werner LUDWIG, DF5BX
P.O. Box 12 70
D-49110 Georgsmarienhutte
GERMANY

(cont'd on page 20)

G-TOR's™ Evolutionary Improvements!

by Phil Anderson, WØXI

Advances in equipment technology are usually incremental; each inventor adds improvements to the work of past inventors. These changes give the new device its character – its "invention." New products/concepts are not necessarily "better"; perhaps they should be described as different or evolutionary. The history of innovation for HF digital communications systems for the Amateur Radio Service has progressed similarly. G-TOR builds on Pactor, Pactor built on Packet and AMTOR, Packet built on X.25 telco telecommunications innovations, AMTOR built on commercial TOR systems and RTTY, and so on.

"G-TOR and its uses continue to evolve"

G-TOR's evolutionary, distinct, and patentable contributions are many. G-TOR implements a number of signal processing concepts for the first time in a multi-mode TNC:

1) a Hybrid-ARQ cycle
2) forward error correction coding
3) full-frame data interleaving
4) fuzzy ACKS
5) multiple tables (both upper and lower case alphabets) for data compression
6) run-length compression
7) and substantially reduced data frame overhead.

These are distinctive and do not appear in previous system implementations.

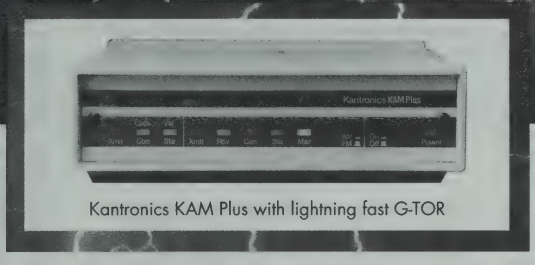
Obviously, one of G-TOR's strengths is that it is a protocol rather than a hardware system. Therefore, G-TOR may be implemented with any HF AFSK modem of the designer's choosing, unlike some HF modes that rely on a particular set of hardware (and often a proprietary modulation waveform) to establish a hardware-software protocol (system). This allows G-TOR to be utilized inexpensively and makes it possible for G-TOR to be implemented by other existing TNCs or systems using standard amateur HF AFSK modems. For HF amateur use, any number of modems could be adapted for use: AFSK, FSK, BPSK, QPSK or other multi-tone forms. In this way, G-TOR's evolutionary impact could extend well into the future.

Another of G-TOR's strengths is subtle and not explicitly reported to date. At first glance, one might assume that the use of error correction bits – (24,12) Golay code – would result in a throughput reduction of 50%. However, the extended Golay code is one of a handful that is invertible. In other words, if a frame of parity bits is deemed to be without error, i.e., the parity bits and CRC checksum are divisible by the CRC-16 polynomial, then the frame of parity bits can be "inverted" into data! (This feature is not available with the Reed Solomon code.) This enables G-TOR to alternate data and parity frames, using parity as data if errors are not detected. Hence, the system can run at full speed when conditions are good! This is one of the innovations that results in G-TOR's increased throughput.

To date, over 6,000 G-TOR EPROMS have been shipped for use with the Kantronics' KAM Plus or KAM with Enhancement Board. And now, additional manufacturers have licensed and are porting G-TOR into their hardware. In addition, several communications software coders have added G-TOR monitoring (GMON) to their HF terminal programs as a "hot key" feature. As a result, G-TOR and its uses continue to evolve.

G-TOR is a trademark of Kantronics Co., Inc. Patent pending.

Pactor is fast. G-TOR is more along these lines.



Kantronics KAM Plus with lightning fast G-TOR

The KAM Plus strikes again. It's now available with lightning fast G-TOR, a Kantronics innovation. More than twice the speed of Pactor in most band conditions, this error-correcting mode is the fastest HF mode available in a stand-alone TNC.

In addition to G-TOR, the KAM Plus operates the other popular modes and is capable of operating an HF mode and VHF packet at the same time. The KAM Plus also features more than 100K of personal mailbox space. And like most Kantronics products, the KAM Plus is small, portable and equipped with a NEWUSER command set and on-line helps.

KAM Plus with G-TOR. Together, the two are taking HF digital communications by storm.

Kantronics

For more information, contact your authorized Kantronics dealer or Kantronics at 1202 E. 23rd St., Lawrence, KS 66046-5006 913-842-7745 FAX 913-842-2021

DX News

The latest digi-doings from around the globe

by Jules Freundlich, W2JGR • 825 Summit Ave., Apt. 1401 • Minneapolis, MN 55403

Will equipment used in amateur radio digital communications ever speak a common frequency language....digitally speaking?

I was reminded once again, recently, of the confusion existing as to what describes a digital radio frequency. A few weeks ago, I hooked up on RTTY with an old friend, Stephen, VP8CIL in the Falkland Islands. Stephen is back on the mode after a sojurn in the UK. I was using the old faithful PCI-3000, and operating in FSK. Stephen suggested we move to Pactor "on this same frequency." I agreed to listen for him, exited PC-AMTOR software, and unplugged the PCI-3000 from the Omni VI. I patched in the cable from the PCI-4000/M, brought up PC-COMM software for the Pactor option, and enabled LSB on the Omni VI. Stephen was using a KAM Plus. I do not know what radio he was using. After waiting for him for a few minutes on "the same frequency", and hearing nothing, I tuned the Omni VI and found him calling me, on Pactor, about 2.1 khz. up the dial. Of course, the PCI-4000/M, with HAL PC-COMM software, operates on LSB, and that is where he should have been. But my transceiver was no longer "on the same frequency"..or was it?

How should he have defined where we were to meet? I think he should have simply defined a "MARK" frequency, rather than "the same frequency." Then, both of us, each knowing whether we were operating on FSK or LSB would have known what our dial readout should have been. Tim, KC4ZGP in Warner Robins, Georgia, in a packet message to GTOR@USA, advises how to find his G-tor mailbox, which contains a list of 143 stations on G-tor. He describes it's location as follows: "14.070 Mhz/FSK mark/2125 Hz, shift/200 Hz; 14.072.12/LSB mark/2125, space/2325 Hz, KAM's shift:modem." He further states that "no two radios are alike, slight tuning is required. When you call, tune your transmitter's frequency up or down a few hertz. When you hear my transmitter, tune your receiver's frequency up or down a few hertz. A solid link follows." That says it all! We have beaten on manufacturers for higher and higher frequency readout resolution, and to what end? Looking far ahead, when we can expect much narrower bandwidth modes to be developed for higher spectrum usage efficiency, will I ever be able to find your signal at a prearranged spot? I suppose that nirvana will not occur unless our rigs are as accurate and stable as secondary frequency standards.

Working DX is certainly not confined to real time exchanges. The profusion of mailboxes, both on VHF and HF has, in recent years, added a whole new dimension to amateur radio DX communications. Forget Internet and wired E-mail. I am talking about RADIO. I picked up an "ALL" message from WA8DRZ's 20 meter Amtor mailbox that originated at VE8YEV.#INU.NT.CAN.NA in the remote village of Inuvik in the frozen land of Canada's Northwest Territory. The message was from David, VE8NC, who is assisting Sylvia, VE8SR in teaching amateur radio to a class of Grade 6 students. It contained a story written by a six grader named Kristine McLeod and filled almost three single spaced printed pages on my H-P Deskjet 520.

The essence of Kristine's essay was a description of her native town and region, and to me was a short lesson in both geography and anthropology. It invited responses from anyone who wished to say a few words about their own community, and also solicited QSL cards for posting on their wall map. I fired off a short description of my adopted state, and offered to follow up with more information if requested. I hope that some of my ham brethren did the same. I can think of no finer way to inspire newcomers, particularly youngsters, to ham radio, than by such international exchanges. I hope I can report to you soon, that I have heard back from the Grade 6 class at Inuvik. Incidentally, I did work David, VE8NC on RTTY back in 1985 and in 1987! His QSL card appropriately contains a beautiful photo of a wild polar bear.

Look for a new addition to the RTTY DXCC Honor Roll in a forthcoming issue of QST. Camille, KA5CQJ received a Christmas present in the form of his 317th confirmed current country. I believe this will be the first U.S.A. addition to that Honor Roll. Several more are close behind. K2ENT, W2FG, WB2CJL, W5ZPA, K6WZ, and others are slowly narrowing the gap!

SURVEY RESULTS, PART 2

The 1994 DJ Needed Digital DXCC Countries Survey included the entire list of current DXCC countries. In Part 1 of the Survey Results in the January issue, the first 28 ranks included the countries that were needed by 100 percent down to 35 percent of the respondents. The listing below accounts for the balance.

Survey Results (Cont'd)
(needed by 33% or less)

RANK	PREFIX	COUNTRY	% NEED (rounded)
29	5H	Tanzania	33
9	9M2,4	West Malaysia	33
29	9M6,8	East Malaysia	33
29	AP-AS	Pakistan	33
29	CY9	St. Paul Is.	33
29	FO/c	Clipperton	33
29	JD1/o	Ogasawara	33
29	T3	West. Kiribati	33
29	T5	Somalia	33
29	V8	Brunei	33
29	YJ	Vanuatu	33
29	ZC4	Br. Sov. Bases	33
29	ZK1/n	Cook Is. North	33
30	5B	Cyprus	31
30	5V	Togo	31
30	6Y	Jamaica	31
30	J6	St. Lucia	31
30	KC6	Belau	31
30	KH1	Baker/Howland	31
30	KH7	Kure Is.	31
30	ZA	Albania	31
31	3B8	Mauritius	29
31	3C	Equat. Guinea	29
31	4K2,UA1	Fr. Joseph Lnd.	29
31	5R-5S	Madagascar	29
31	9V	Singapore	29
31	C2	Nauru	29
31	CE0X	San Felix/Amb.	29
31	EX,UM	Kyrgystan	29
31	H4	Solomon Isl.	29
31	OY	Faroe Isl.	29
31	VP8/o	So. Orkney Is.	29
31	XF4	Revilla Gigedo	29
31	YN	Nicaragua	29
31	Z3,4N5	Macedonia	29
32	BV	Taiwan	27
32	C3	Andorra	27
32	J2	Djibouti	27
32	JT-JV	Mongolia	27
32	KP1	Navassa Is.	27
32	SU	Egypt	27
32	V6	Micronesia	27
32	VK9/m	Mellish Reef	27
32	XT	Burkina Faso	27
33	3D2	Fiji Isl.	25
33	5U	Niger	25
33	9K	Kuwait	25
33	9L	Sierra Leone	25
33	CN	Morocco	25
33	KH3	Johnston Is.	25
33	SV9	Crete	25
33	TR	Gabon	25
33	V4	St. Kitts/Nevis	25
33	VP2V	Br. Virgin Isl.	25
33	VU	India	25
33	XX9	Macao	25
33	YS	El Salvador	25
33	ZD7	St. Helena	25
34	3Y/p	Peter I Is.	23
34	4L,UF	Georgia	23
34	4U1/i	ITU Hq. Geneva	23
34	5W	Western Samoa	23
34	5X	Uganda	23
34	9G	Ghana	23
34	D2-D3	Angola	23
34	E3	Eritrea	23
34	FR	Reunion Is.	23
34	FY	French Guiana	23
34	GU,GP	Guernsey	23
34	OX	Greenland	23
34	P2	Papua N. Guinea	23
34	S9	Sao Tome/Princ	23
34	T7	San Marino	23
34	TF	Iceland	23
34	TY	Benin	23
34	Z2	Zimbabwe	23
35	5Y-5Z	Kenya	21
35	9I-9J	Zambia	21
35	A4	Oman	21
35	EA9	Ceuta/Melilla	21
35	EI-EJ	Ireland	21
35	FP	St.Pierre/Miq.	21
35	GJ,HG	Jersey	21
35	HQ-HR	Honduras	21
35	HS	Thailand	21
35	KH9	Wake Is.	21
35	OD	Lebanon	21

35	PZ	Suriname	21
35	VP2M	Montserrat	21
35	VQ9	Chagos Is.	21
35	YV0	Aves Is.	21
36	4U1/u	UN Hq. NY	19
36	8P	Barbados	19
36	ER,UO	Moldova	19
36	FJ,FS	Saint Martin	19
36	J3	Grenada	19
36	JW	Svalbard	19
36	T32	ast Kiribati	19
36	TG,TD	Guatemala	19
36	TZ	Mali	19
36	UA2	Kaliningrad	19
36	UJ-UM	Uzbekistan	19
36	VP9	Bermuda	19
36	VS6	Hong Kong	19
36	YB-YH	Indonesia	19
37	5N-5O	Nigeria	17
37	6V-6W	Senegal	17
37	7P	Lesotho	17
37	9H	Malta	17
37	9Y-9Z	Trinidad/Tobago	17
37	C8-C9	Mozambique	17
37	CT3	Madeira Is.	17
37	DU-DZ	Philippines	17
37	GI,GN	North. Ireland	17
37	HB0	Liechtenstein	17
37	HC8	Galapagos Isl.	17
37	HZ	Saudi Arabia	17
37	IS	Sardinia	17
37	J8	St. Vincent	17
37	KG4	Guantanamo Bay	17
37	KH2	Guam	17
37	OK-OL	Czech Republic	17
37	TA-TC	Turkey	17
37	VP2E	Anguilla	17
37	VP8	Falkland Isl.	17
37	ZF	Cayman Isl.	17
37	ZK1/s	So. Cook Isl.	17
38	7Q	Malawi	15
38	9A,YU2	Croatia	15
38	A3	Tonga	15
38	BY,BT	China	15
38	CU	Azores	15
38	EU-EW	Belarus	15
38	EZ-UH	Turkmenistan	15
38	FO	Fr. Polynesia	15
38	LY,UP	Lithuania	15
38	OH0	Aland Islands	15
38	PJ5-8	St. Maarten,Saba	15
38	SV-SZ	Greece	15
38	TU	Ivory Coast	15
38	UN-UQ	Kazakhstan	15
38	V2	Antigua/Barbuda	15
38	V7	Marshall Isl.	15
38	VR6	Pitcairn Is.	15
39	A2	Botswana	13
39	CP	Bolivia	13
39	CV-CX	Uruguay	13
39	FM	Martiniique	13
39	HB	Switzerland	13
39	HK0/a	San Andreas&Pr.	13
39	HV	Vatican City	13
39	OA-OC	Peru	13
39	OM,4N3	Slovak Republic	13
39	S5,YU3	Slovenia	13
39	V5	Namibia	13
39	YL,UQ	Latvia	13
40	4X,4Z	Israel	10
40	EA6	Balearic Isl.	10
40	GM,GS	Scotland	10
40	GW,GC	Wales	10
40	HC-HD	Ecuador	10
40	J7	Dominica	10
40	OE	Austria	10
40	P4	Aruba	10
40	PJ2,4,9	Neth. Antilles	10
40	SA-SM	Sweden	10
40	TK	Corsica	10
40	YO-YR	Romania	10
40	YT-YU	Yugoslavia	10
40	ZD8	Ascension Is.	10
41	C6	Bahamas	8
41	CM,CO	Cuba	8
41	EA8	Canary Isl.	8
41	HA,HG	Hungary	8
41	HL	South Korea	8
41	KP4	Puerto Rico	8
41	LA-LN	Norway	8
41	LX	Luxembourg	8
41	LZ	Bulgaria	8
41	ON-OT	Belgium	8
41	OZ	Denmark	8
41	SN-SR	Poland	8
41	TI,TE	Costa Rica	8
41	UA1,3,4,6	Eu. Russia	8
41	ZP	Paraguay	8
41	ZR-ZU	South Africa	8
42	CA-CE	Chile	6
42	CT	Portugal	6
42	ES	Estonia	6
42	FG	Guadeloupe	6
42	HJ-HK	Colombia	6
42	LU	Argentina	6
42	PA-PI	Netherlands	6
42	PP-PY	Brazil	6
42	UA8,9,0	Asiatic Russia	6
42	UR-UZ	Ukraine	6
42	YV-YY	Venezuela	6
43	DA-DL	Germany	4
43	EA-EH	Spain	4
43	G	England	4
43	HI	Dominican Rep.	4
43	I	Italy	4
43	KH6	Hawaii	4
43	V3	Belize	4
43	XA-XI	Mexico	4
43	ZL-ZM	New Zealand	4
44	F	France	2
44	HH	Haiti	2
44	HO-HP	Panama	2
44	KL7	Iaska	2
44	KP2	Virgin Isl.	2
44	OF-OI	Finland	2
44	VK	Australia	2
45	JA-JS	Japan	0
45	K,N.W.A	United States	0
45	VE,VO	Canada	0
45	VP5	Turks/Caicos I.	0

(End of Listing)

I find some of the results, of the entire list taken as a whole, somewhat surprising. Of particular note is the low ranking of many African and Asian countries. Rather than cite specific examples, I leave it up to the individual reader to unearth his own set of surprises. They are sure to be quite diverse, depending on your own country count, and your own location.

I hope that the overall survey results, as limited as they are due to the relatively low number of respondents, have been of interest to you Digital DXers.

DX DOINGS

(Signals are 45.5 Baud RTTY unless noted.)

Note that the DX Doings below include activity as reported from world-wide sources. Therefore, some stations may not be seen, in your particular part of the world, at the hours indicated. To make best use of the data given, couple it with your knowledge of propagation paths to your QTH. For help in this regard, see the monthly propagation charts in QST, and listen to the hourly propagation forecasts at 18 minutes past each hour on WWV. Good luck!

ANTARCTICA, Various prefixes - Several stations are said to be active on RTTY from Antarctica. Except for activity of IA0PS on 20 meters around 0645Z, and VI0ANT on 20 meters around 0230Z, detailed on-the-air reports are scarce. Also mentioned are VK0FPS, and IA10PS (celebrating the 10th anniversary of the Italian base).
The Diamond DX Club (Italy) has compiled a list of 20 stations supposedly currently active from various bases in Antarctica. Countries represented include Russia, Japan, India, Chile, Germany, Poland, USA, Italy, Argentina, Peru, Australia, United Kingdom, and Brazil. None are identified as being on RTTY, although other sources have tagged the three stations mentioned above.

The Club publishes a 30 page list of more than 600 calls from Antarctic bases since 1959. The "Antarctic Bases List" also includes information for Antarctic awards. Information can be obtained by writing to Massimo, IK1GPG at his CBA, or by sending a packet message to him at IW1BIM.IPIE.ITA.EU.

AUSTRALIA, VK - Kark, VK2KM, puts a nice signal into the USA on 20 meters around 2100Z to 2200Z. Karl is an avid contestor who must be reckoned with, particularly in the ANARTS contest. QSL via CBA. Syd, VK2SG, the founding father,(with Bill, VK2EG) of the weekly on-the-air VK2SG RTTY DX Notes monitors Pactor on 14067 (mark) 24 hours a day. Give him a call. QSL via CBA.

CONGO, TN - There are signs that amateur radio may soon be following the lead of Ghana in soon opening up amateur radio on a permanent basis. Last summer, Rudi, DK7PE obtained a limited license to operate CW there. As a result of establishing a friendly dialog with the authorities, Rudi arranged for an initial packet of background information to be sent to the telecommunications authorities in Brazzavile with more to follow. It is expected that IARU will be taking an active hand in this effort to restore ham radio to this country in the not too distant future. Congo ranks second behind Yemen and Heard Island in the Needed Digital Countries survey.

FALKLAND ISLANDS, VP8 - Tim, VP8CKN is a science teacher in the Falklands. He will be there at least for another year. Look for him on 20 meters

(cont'd on page 23)

(Contesting - cont'd on page 15)

COMMENTS: There are 2 distinct contests here: Part I is in February and Part II is in July. Each part is identical except for the date, and the bands to operate on. In addition, each part is divided into 2 distinct time segments, each 6 hours long. The "Saturday segment" of Part I is for operation on 20, 15, and 10M, and runs from 1000Z to 1600Z. The "Sunday segment" of Part I is for operation on 80 and 40M, and runs from 1400Z to 2000Z. Part II, in July, reverses the band operation for Saturday/Sunday segments. Got that? GOOD!

NOTE: There are no multipliers for USA call areas. Just the STATES count for mults. Also, NO band multipliers. This means that only your FIRST USA QSO in the contest will count for a DXCC/WAE country mult, along with the State mult.

No mention was made in the official rules about how to count KH6/KL7. Are they USA states or separate countries? Most contest rules count them as separate countries. I plan to do just that. It makes more sense and is less confusing, especially when counting the QSO points.

DARC CORONA 10M Digital Contest

March 5, 1995

Sponsored by Deutscher Amateur-Radio-Club e.V. (DARC)

CONTEST PERIOD: Sunday, March 6, from 1100Z to 1700Z (6 hours)
NOTE: Contest will take place on the first Sunday of March, July, September, and November of each year.

MODES: RTTY, AMTOR, PACTOR, and CLOVER

BANDS: 10M ONLY

CLASSES: A - Single op B - multi- op C - SWL

CONTEST CALL:
for RTTY: **"CQ CORONA TEST DE ....."**
for AMTOR/PACTOR: **use FEC (mode B) for "CQ CORONA TEST de sellcall XXXX"**

Use ARQ (mode A) for answering and contest exchange. Contest exchange in any other mode is subject to disqualification.

EXCHANGE: USA stations: send RST + QSO nr. + name + State
All others: send RST + QSO nr. + name

CONTACTS: Additional QSOs are allowed with same station on different mode after a 15 minute interval, or after a QSO with another station.

MULTIPLIERS: Each DXCC/WAE country, and each USA state, and each call district in JA,VE,and VK, (NOT USA). Count only the first QSO with a USA station as a DXCC/WAE country multiplier.

QSO POINTS: Count 1 point for each completed QSO.

FINAL SCORE: Total QSOs x total multipliers.

AWARDS: To top stations in each class, country, and district mentioned above.

LOGS: Use separate logsheets for each mode. Logsheets must contain: Date, Mode, Time UTC, Callsign, message sent/received, name, USA-State, first-time multiplier prefix, and QSO points. Also required is a Summary sheet with a list of claimed multipliers. If entry is multi-op, please list names and callsigns of all ops. Comments are very much appreciated.

DEADLINES: All logs must be received by 60 days after the Contest. Mail to:

Werner LUDWIG, DF5BX
P.O. Box 12 70
D—49110 Georgsmarienhutte
GERMANY

COMMENTS: This is an all-digital 10M contest, except for HF Packet, and it is 6 hours long. It occurs on Sundays, 4 times a year. There are no multipliers for USA call areas. Just the STATES count for mults. This means that only your FIRST USA QSO in the contest will count for a DXCC/WAE country mult, along with the State mult. No indication was made about counting multipliers again after changing digital modes. No mention was made in the official rules about how to count KH6/KL7. Are they USA states or separate countries? Most contest rules count them as separate countries. I plan to do that. It makes more sense and is less confusing. With the propagation forecasts looking rather poor for 10M, this Contest will really be a 6-hour challenge. Let's see if the really high power stations can ionize some paths for us. Stay tuned (up).

— SO... WHAT'S AHEAD? —

This year promises even more explosions in technology. The communications field is especially in the spotlight. It is truly amazing what is actually being done these days. Take the new little satellite dish for TV for example. Will its innovations eventually wipe out cable TV? Will it become interactive? And if so, will it require a CB license? What about Internet? Will it go satellite, too? Licenses? How could Internet be controlled to prevent it from becoming a vast drug intercom? Where is Microsoft's Bill Gates taking the PC world? And, finally, what's the future of the new digital modes? Stay tuned!

No one person can hope to keep up with all of this. It's staggering...

Technology seems to be expanding in 9 directions at the same time. To try to keep up, take on one or two of the more interesting ones, because soon they too will be exploding in 9 directions! Open competition is the driving force. Innovation in research and development is where its happening. That's where the heavy contesting is going on. And Personal Computers are the BIG tools.

When I joined IBM Research in San Jose in 1956 I started in Patent Engineering and Exploratory Research (PEER). My job: take the hen-scratchings of the brilliant ones and diligently try to make a working model to prove validity of their patent disclosure. That was a real challenge! And lots of fun! I was working with bright, energetic engineers that had designed IBM's RAMAC computer, the world's first on-line business computer. It's Random Access Memory was a huge stack of spinning disks, coated with magnetic iron oxide. The machine was a great success and a real money-maker.

In those days we were working on optical and magnetic character recognition, read/write magnetic head designs, magnetic memory devices, including coated drums, disks, tapes, and core memory beads. All this was before transistors and integrated circuit chips. We used tubes!

In 1957 I remember attending a seminar on research goals and heard a great story by the presiding engineer:

An inventor called a press meeting to announce that he had perfected a flawless language translating machine. He invited one of the reporters to type out a short message on a card punch machine, then insert the card into a slot and select any foreign language button on the control panel. He did so, and a punched card came back out with a message written across the top, in Chinese.

Since no one there could read Chinese, the inventor suggested that he put the card back into the slot and press the English button.

He did so, and a new card came back out. The inventor then read the card aloud. It said, "To be blind is crazy." With a frown, the inventor asked, "What did you type on the original card?"

The reporter replied, with a smile, "Out of sight, out of mind."

Obviously, we still have a long way to go. Language translation and speech recognition devices are extremely difficult and frustrating challenges. I predict that nothing in the foreseeable future will adequately replace keyboards for for data entry. Those waiting for speech recognition would make better use of their time by taking typing lessons.

Working in research is not a job for just anyone. Most things tried don't work the first time. Or the second time, either. It can be down-right discouraging. One has to be persistent and resilient to be able to bounce back, confident that maybe it just might work with a little more sweat or a minor tweak here and there.

What's exciting for me is that in research you're going down paths that have never been traveled before. Lots of times new things are discovered along the way that were not the original goal. Since the funding is for the first goal, one should take careful note of the new discovery and tackle it after finishing the original one. That makes for an encouraging push to get hopping!

A research axiom: For every 10 ideas tried, 9 will fail. But the 10th one is certain to be successful and pay back ten-fold for the failed nine.

((73)) See you in the pileups, Rich, N6GG

P.S. Drop me a line with an idea to share,
Or, drop me a line with an item to air.
Drop me a line with anger to bare...
But don't drop ME... 'cause I care!

Software Review

File Manager 3.0 by Central Point Software

by Jim Mortensen, N2HOS

At the core of your computer lies the file . . . dozens, hundreds, thousands of files, some of which benefit everything you do at the keyboard. Others strangle your operating system, confuse the operator, defy interpretation, deny translation, steal your disk capacity and hide secrets you want and need. This "lost in the swamp" felling compounds itself by the ruthless file name limitations of DOS. Never have so many suffered so much for so few letters (seven to be exact)! Welcome to the club! We all, that is all who labor under the banner of the Windows operating system, need help and it has been hard to find.

No subject draws the attention of so many software writers, and no single project accounts for so many entries in shareware libraries as those labeled "Replacement for Win3.1 File Manager." I have tried a dozen of them and discarded them all, even though some promised a bit of relief from the inadequacies of the File Manager we know so well. I purchased two commercial products, tried those contained in great utility programs like Norton and Central Point, and still felt the need for something more suited to my needs.

About two months ago a letter arrived from Central Point Software announcing "File Manager 3.0," a letter filled with the promises which, if true, solved all my problems. The price was so low (I think it was $39.95 with shipping) I couldn't resist. I presume this will be a part of the next version of PC-Tools and was offered as a special deal to registered owners. Prepared for the usual disappointment, I opened the package, installed the program and started to count the ways I didn't like it. There were a couple of little things that are beyond my comprehension or my liking. For example, I don't like manuals with red covers, nor to I like those obtuse definitions of search routines that confuse even a heavy hitting actuary. But after a bit of use, I must admit the program delivered more than the letter promised—far more than expected. And, in a word, I am delighted to have FM3.0 on the hard disk; and, needless to say heartily recommend it to one and all.

Let's begin with what to me is its towering achievement. This little program (well, it does occupy about six megs on your hard disk, but in this day and age, that is a tiny bit of space. And besides, there is a reason for needing it) does what the biggest programs cannot do. Repeat, cannot do . . . even though they should. Word for Windows, by way of example, lacks the ability to even view, let alone print WP6.0 files, not to mention translating them into Word format. So what do have in File Manager? An incredible array of viewing power allowing you to not only see what is in the file but to copy it or print it in its native format without launching the program . . . or without even having the program in your portfolio! Don't misunderstand me, I am not talking only of WP6.0, I am talking about any program you can imagine . . . word processing, data base, spreadsheet, or what have you. It is fascinating to scan the files on your disk to see the power of this feature. If it stopped there it would be impressive, but that is but the beginning. For you can view any graphic format as well. A TIF file, even if it is compressed, is available to you in its full, glorious color. It appears in the first instance as a very small image at the bottom of the File interface. But, click zoom and you have a full screen image. Amazing, and if FM3.0 could do nothing else it would be an excellent product.

But on we go to other attractions. Take compression for example. If you do any file zipping (and you should if you exchange any files via landline or on the air) you know all about the vagaries of PKZIP. Revel in the joys of FM3.0's compression scheme. It is really and truly as easy as pie. Bring up the File program, select the file you wish to compress, click the compress button in the upper left hand corner; then, if you wish to change the file name, type in the file name and destination in the space provided on the new screen. And its done! For example, I just sent a letter to TY1PS on CompuServe (two pages for less than half the price of airmail postage, by the way). I selected the file in the Winword\Jrnl directory, clicked the compress button, saved it as XX.zip in the Winword directory and it was done. Then once in CIS Navigator software I merely type "Peter," the index selects the full name and address, I click "Send File," type in the file name and off it goes FM3.0's compression format supports PKZIP, .LZH, ARC and PAK, which covers all or most of the waterfront, at least as far as I am aware.

There are other uses of compression, the most important being space saving on your hard disk. If you are getting dangerously close to capacity, compress all those files you don't need now but must have on the disk and place them in an archive directory. Entire directories can be selected for compression as well. By the way, you can protect those historic files with a password if you wish . . . but don't forget the password.

Expanding files is as easy as compression. Select the file or directory and then click the "Expand" button and it is done. Expansion can also be done selectively. Click "Contents" (if you are opening a compressed directory) then select the individual file. They can be expanded non-stop into their original directory—from Archive to Winword for example—or be deleted or edited. Compressed executable or data files can be launched in exactly the same manner you launch uncompressed files. This is a remarkably valuable utility.

The list goes on. I discovered late in the game a gem called File Companions. It loads with a click of the mouse at installation and the program reminds you whenever you move into Windows that this subprogram is available. I noticed the reminder about a dozen times before I checked the manual to see just what it would do. In short, File Companion sneaks into each of your Windows programs and makes itself available to you whenever and wherever you wish. For example, if you are in your word processor program, have just completed, saved and closed a file containing a 12 page memo to your mother (who quite naturally has a Pentium computer and is connected to CompuServe) click Open or Save As in the File menu. In the upper left hand corner of the new window you will see a miniature version of the FM3.0 icon in a pop-up window. Click it and find virtually every file utility available. Compress directly from the word processor (not directly from the document itself, however, or you will get a file sharing error. Save and close the file first). Make a new directory, rename, move, copy, delete, view . . . essentially the entire program can be accessed this way. In Word 6.0 I find this a great improvement over the limited facilities given us by Microsoft.

You would expect most of the other features. File trees for each drive can be viewed in any form desired. Select the nine most recently selected directories. Run multiple windows, use it on networks; customize it, search it; all very valuable but nothing particularly new and exciting. Perhaps the search feature is worth a word or two. All directories can be searched for executable files (.BAT, .COM, .EXE OR .PIF.). All files can be searched for either text or graphic files (.DOC, .TXT, .INI, etc). Compressed files may be searched if they have either ZIP, ARC, PAK, LZH or LHA extensions.

If searching for text merely enter "*.TXT" in the File Specification box. Then type in the text fragment or graphic you wish to find, select the drive to be searched, click the "Start" button and the process begins. Many options exist but they are more or less standard for such routines. Suffice it to say that the search engine appears to be a powerful tool for locating those hard to find files.

There is more, much more. Full file management is available at a click of the mouse. Move, Delete, Rename, Make Directory, Remove Directory, Copy; every standard command is available without shelling to DOS or going to any other directory. The word "Efficiency" best describes these basic file management tools. All commands are visible on the desktop, easy to click with the mouse—factors that make the sometimes awkward file handling tasks such a chore.

But it is the file viewing and smooth compression routines that won me over. And as I look again at the entire program it is the power of these two features that earn File Manager 3.0 a permanent place on my hard disks. Find it and enjoy!

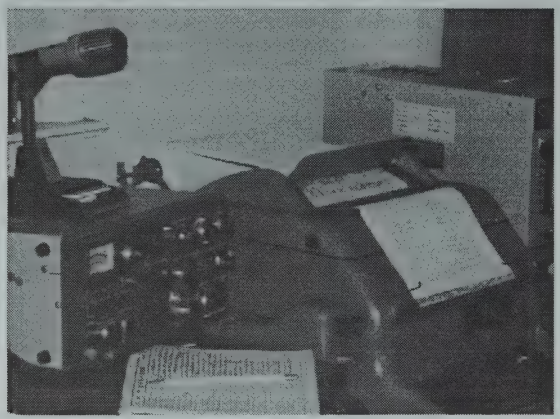
De Jim N2HOS sk

A Bit O' History

A Wireless Printing Telegraph - Part 2

by Crawford MacKeand, WA3ZKZ

115 South Spring Valley Road • Wilmington, DE 19807



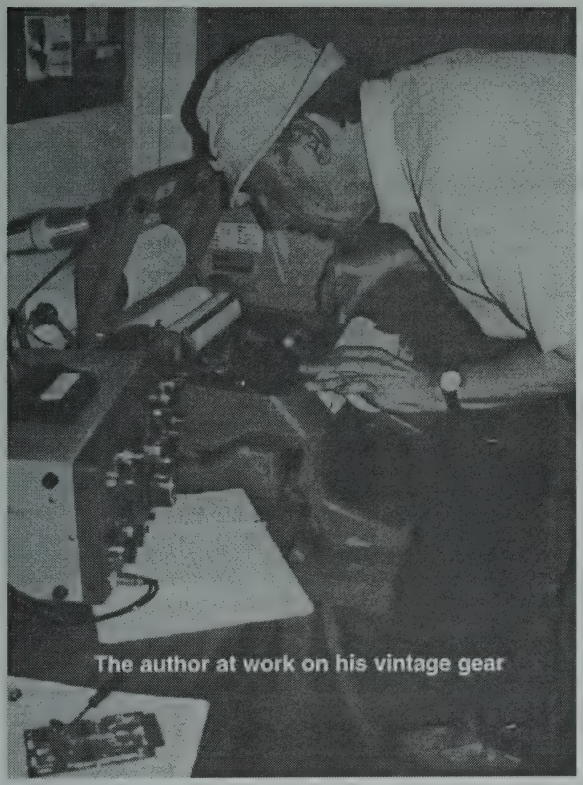
So here I was in New Jersey in 1972 with a brand new WA call and a Hammarlund HQ215 and a much rebuilt Ameco TX86 go with it. My interest had been refired by a QST article on the ST-3, and lots of folk will remember that one of the very necessary components was the ubiquitous 88 mH telephone loading coil. Ubiquitous, that is, if you could find someone who had them for sale. Radio Shack at that time was very far from nation-wide and the local parts supply house surely had never heard of these wonderful toroids. But luck was with me. One of the sources cited in the article was Van W2DLT who lived not too many stones throws from me. A phone call, a visit, and I had the toroids in hand. Even better, Van admitted to being a source of supply for a TTY machine.

There was no way you just went out for a store-bought machine. For a start the new price was well up in the thousands of dollars, when ham gear was in the hundreds. So a vital secondary market evolved as older machines were taken out of service by the railroads and the telegraph companies (yes, Virginia, in the 1970s Western Union was still a telegraph company as were several others), and even by the phone companies. Often a statement, signed in all solemnity was required to the effect that the machine would never, never, ever be placed into commercial service! But, Van had a supply of German Lorenz machines in an elves workshop in a basement somewhere in South Orange or East Apple or some other such old New Jersey town. I bought one and was in business. It was a finely constructed and massive machine. (Sometimes referred to, by the unwashed, as a 'clunker'.) I rewired it for my ham needs, set up the WRU with my call, made some CQ tapes, and away we went.

The WRU by the way was then a mechanical (well, it was all mechanical, wasn't it?) sub system that saw and recognized an incoming Figs-D (I think), and went into low earth orbit pounding out whatever very brief message you had inserted. Insertion was a matter of pushing, prying, prodding and slipping fiddly little steel detents into slots in a rotor until you had the right message. I believe I told mine to say QRA WA2ZVX, which I thought was a very crafty use of space. Since no-one else set theirs up that way, maybe it was only a half-baked idea, but there it was. The only snag was that anytime a perverted 'D' came in in Figs mode, away it went, and in the middle of a QSO that was unhelpful. (It was easy enough to disable in the Lorenz, but later on the more difficult, and very screwdriver & wrench oriented modification needed for the Siemens machine, was the basis of one of my first articles for the then RTTY Journal.)

The transmitter as I told you, was an Ameco TX86, which I bought in a radio club auction for $10 before my license arrived. It had been a crystal controlled CW/AM rig, and when I had finished with it, it sat in a cabinet with its own power supply (transformer from an old TV as was normal) and an internal FSK diode modulator. Real diodes, (a 6AL5?) not solid state ones. So I set out to make contacts. Back then one logged CQs as well as QSOs, and I can tell you that with the relative scarcity of RTTY stations, and with a rock-bound transmitter, the first few pages of my log show quite a lot of CQs and calls, and not many QSOs. Let's look. I call CQ on the 5th of March 1972 and get my first QSO with Bill VE3ARN on the 19th. Broke up with QRM after 25 minutes it says. Some things don't change. A few days later I found my first BARTG contest and made all of two QSOs. This was on 850 cycle shift of course. (It seems to me that we all went to 170 Hz shift about the end of 1972). But very naturally these results found me a bit less than ecstatic, so I built myself a VFO, which was not wonderful. The situation soon improved a little later when I found a neat little Collins 310B exciter at a hamfest. Quickly modified and stabilized, and with a new pi-section tank, it was a pretty decent FSK rig, although only delivering 35 watts from a solitary 2E26. (But I even had to stabilize the A.C. supply to the VFO tube heater to get it solid enough for 20 meter use; still, not too bad for a 1949 transmitter!)

The next episode in the saga was a most wonderful windfall. My company had its offices in downtown New York City, right in the financial district, off Wall Street, and was moving everything out to suburban New Jersey. The property in the city had been ready for the wrecker's ball for a few months, except that it had been the nerve center of the company's telecomms network too. The scene now shifts to the Morris Radio Club. Our secretary, (W2???) a delightful lady who worked for the telecomm manager at the self-same company, announced that there were some TTY machines free for the asking for anyone who wanted to go to New York and pick them up. I was a very new member and hesitated to say too much, but no-one else was interested, so next day I called her at work. Yes they were available, and here was the guy to contact. After one abortive trip to the big Apple, I had a date for the next Sunday and my XYL and I headed into the rattling empty canyons of the almost deserted business area of the city with our trusty VW bus. The entrance wore an even more forlorn look than any other Sunday. The wreckers crew had already started work, and the next day would reach the phone room which had been closed down finally on the Friday. Tomorrow was a new month and it would all be their property to scrap, but it was already a sorry sight. The manual switch still had the ad sections from last Friday's newspapers and the chairs looked as if the operators had just stepped out. Sheets that had kept the area habitable for the small staff held most of the debris at bay, but some sad equipment was already deep in dust and dirt. We made several trips up and down the old creaking elevator, thanked my company colleague (who was happy to see any home better than the dump for some of his machines) and set off to N.J. .... very heavily loaded. I'd guess the better part of a quarter of a ton of equipment! My XYL rode shotgun with them to try and keep us on an even keel, always a potential problem with the older buses. I still am amazed that we had in that bus: one Teletype Model 28KSR, one Siemens T100 ASR, (both Baudot machines), two fairly new Teletype Model 33ASRs both full of plaster and mortar where the ceiling had come down on them, and believe it or not, one brand new Teletype Model 35ASR ..... then the absolute top of the line ASCII machine. New York Tel. had recently had a long strike and had moved into or out of the TWX business, I forget which, but in the shuffle the 35 had gotten completely lost. Nobody wanted to own it. The Model 33s I sold to Van, and on the advice of a lawyer friend I kept the 35 for a year or so to establish that it was indeed abandoned property and then it went the same way. We couldn't use ASCII then, so it was fun but useless, and Van was already into commercial work. The T100 I used for years, and the M28 too till it died and was dismantled, being too big to throw away in one piece!



The author at work on his vintage gear

Meanwhile, back at the farm, two meter AM became a local interest and we soon had a local club AFSK net (this time the New Providence Radio Club) running on 145.8, which was then a fairly empty wasteland. My log shows my first QSO in January 1974 with W2LTJ, K2GLS, W2YFM, W2CGX and W2GKF. A few days later I see K2AGI K2TRK and K2QKV, and this pretty much made up the regular contingent. By March of that year I see that I had modified my very secondhand Knight-Kit transceiver for FM, and I think the whole net went over to FM at about the same time. And this seems to have been most of my activity right through early 1975 when I relocated to Delaware. Clearly two meters was no longer the answer for keeping in touch with the old gang, so I find that after a few months in which the log says I worked two meter FM mobile of all things, the frequency of 3600 KHz crops up more and more frequently. I set up a not too elaborate switching system, which with one tweak would take me from the Collins 310B to the TX86, now crystalled for 3600 Khz, on what had rapidly become the East Coast Autostart Net.

One of the problems of the mechanical TTY was that it only took one funny guy to send a series of linefeeds and you were knee deep in paper all over the shack, like a kid in the toilet. And since we were trying to operate on an open basis, we were vulnerable. There were many solutions, some of them based on the M28 stunt box. This was an alarming feast of cams and levers at the back of a Model 28, which would operate a switch or two on receiving a given sequence of characters. One of my trades with Van, however, had been for a Pulsecom electronic stunt box, based on DTL (pre TTL) integrated circuits; a very flexible tool, for all that it had to be programmed with jumpers. If you look at the right of the photo, sitting on top of the TTY, you can see the Pulsecom box. It had lots of space and good power supplies, so it also had my DT600 T.U. (which I still use, much modified), and a UT-4 and lots of other wonderful toys. It may have been all hardware, but the system was quite flexible (if you had good eyesight and a soldering iron handy!). A careful look at the front panel will show you a whole bunch of buttons and knobs and switches, and by next month I'll try and work out what on earth they all did for me. And the UT-4 is a whole 'nother story too. ❑

(DX - cont'd from page 19)

between 2245Z and 0200Z. QSL to P.O. Box 470, Port Stanley, Falkland Islands, via United Kingdom. Stephen, VP8CIL operates RTTY, but having hooked up with you, will prefer to move to Pactor or G-tor. QSL via G0EHR.

GHANA, 9G - With the newborn activity from Ghana over the past two years, this country has moved down in the ranking of Needed Digital Countries. However, for newcomers to the mode, and those who still have not gotten it, John, 9G1BS will be there for two more years. Check 40 meters around 0145Z and 20 meters around 1800-2300Z. In addition you can expect transient visitors from time to time. QSL John to P.O. Box 3248, Accra, Ghana.

GUADELOUPE, FG - Alain, FG5GI works 20 meter RTTY and prefers to rag chew on Amtor FEC, rather than "hit and run". Once he gets you on RTTY, he will insist changing to Amtor. He expresses wonderment why Amtor FEC is not the mode of choice for RTTYers. He normally operates 20 meters around 2200Z but may be found as early as 1530Z on 15 meters.. QSL to Bignon Alain Dorusse B. Gossier, 97190 Guadeloupe, French Caribes.

IRAQ, YI - The Northern California DX Foundation, in its recent Newsletter carries an interesting article entitled "The Story of the Iraqi Amateurs (DX) Group" by Adel M. Aswad, YI1FC. She states that original Iraqi Radio Club (YI1BGD) is now part of the Iraqi Association for Radio Amateurs (YI1RS). It has 150 members, all of them licensed and active operators. They are equipped with a Yaesu FT-101 and a 5-element Yagi. Of particular interest is the statement that they are planning to hold a world-wide radio amateurs convention in Iraq around March 1995. They "want to invite all active radio amateurs in the world on the expense of the Iraqi Association of Radio Amateurs." For information write to Adel M. Aswad. P.O. Box 7441, Baghdad, Iraq. (Tnx NCDXF)

MAURITIUS, 3B8 - Jacky, 3B8CF is active again on RTTY and can be worked on 20 meters between 1630Z and 1700Z. QSL to Seewoosankar Mandary, Shastri Road, Candos, Quatre Bornes, Mauritius.

NEW CALEDONIA, FK - Jean, FK8GV runs Pactor with 100 watts and a wire antenna. He rarely hears the USA but has been worked on 14081 khz. around 1430Z (0130 his time). QSL via JMD, BP 3818, Noumea, New Caledonia.

RWANDA, 9X - 9X5EE continues to be active from this unhappy place. He can be found on 20 meters as early as 1930Z. QSL to PA3DLM.

SOUTH SHETLAND IS., VP8 - As of the beginning of January, Andy SP2GOW, the expected RTTY operator at HF0POL was operating CW using his personal call of VP8CQS. When queried about RTTY?, his answer was a cryptic "NOT YET". Keep alert for either HF0POL or VP8CQS. QSL VP8CQS to DL1EHH. Also keep an eye out for DP1KGI on Pactor. QSL to the German QSL bureau.

TANZANIA, 5H - Jim, 5H3JA is a missionary who is planning to be in Tanzania for six more years. You may find him on RTTY on 20 meters around 1545Z but check also the Amtor and Pactor slots. QSL via AA0OB.

ZAIRE, 9Q - Paul, 9Q5EXV (home call is F6EXV) operates on 20 meters between 1330Z and 1600Z. QSL to F2VX.

HAVE DX NEWS?

Leave a message in the W5KSI Amtor mailbox (1), find me on RTTY, or via any of the following:
Packet: W2JGR @ WB0GDB.#STP.MN.USA.NA
Amtor: WJGR on 14070 khz.
Telephone: (612) 377 7269 / FAX: (612) 374 8161 (mark for my attention) or use my CBA.

THANKS - Thanks to the following for all your information:
AI9W, I5FLN, IK1GPG, K6WZ, K0RC, K0ZL, KC4ZGP, VE8NC, VE8SR, W5KSI, WB2CJL, ZS5S, 9G1BS, NCDXF, and Kristine McLeod.

See you all next month. For now, bye bye from Minnesota, PAX....73 de Jules W2JGR

Footnote: W5KSI scans 7069, 7071, 7075.5, 7076, 14068, 14070, 14073.5, 14074, 14079, 21074, 21075, and 21079 khz.

DIGITAL DIGEST

News, Views, Tips & Reviews

Edited by Tom Arvo, WA8DXD • 4340 Watermill Ave • Orlando, FL 32817
CompuServe ID: 73330,1335

OPINION

Long Live RTTY...

I agree with both Carl (W6WZ) and Eddie (W6/G0AZT) that RTTY is alive and well, and that the DXer's are there and listening! The segment is far-far-far from unused here in WI-land. I'm afraid I can't comment first-hand about what takes place during the day in the week, but at the tail of the day and on the weekends the band is quite busy. I have never heard 20 quiet even when the band is really in poor condition. I am usually listening on the weekends from the time the bands open until they close, and I continue to nab several new RTTY countries every week. In addition to chasing countries for 5BDXCC, I'm chasing 5BWAS and US counties as well. The ONLY way to productively do this is tune-tune-tune and determine if you need them before you call them; calling CQ is a complete waste of time. If I don't need a county or a country I won't answer their call. I'm 90% Dxer, but I ragchew sometimes, and I'm active in all the digital contests. I've also operated from the DX side on both RTTY and AMTOR. From a DX point of view, as Eddie said, RTTY makes more sense if you're interested in total count. Finally, if you find some of these comments suspect, just ask my XYL; she says I live in the shack!

So count me against the use of PACTOR in the 14080-90 segment, and for moving Packet and other BBS out of that same segment. Please give us some room; RTTY is not dead yet.

73, Bob W1VXV

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I have read, with great interest, the dissertations of N2HOS who has SOME relative points and that of GOAZT, whom 1 100% TOTALLY agree with. I believe some relative points may have been missed due to the emotional aspects of the discussion!

As voiced by Eddie, GOAZT, the burst modes cannot handle the DX pileups because of the handshake requirements of those modes. is a known fact that the "burst" modes were created for message handling, which it does a beautiful job. It is also for those perfectionists that desire error free rag chewing, the "burst" is "where it's at": But again, baudot is "where it's at" for RTTY contests, DXpeditions and DX! Let us not shut the door to these baudot activities by allowing "bursts" in the 10 Khz window.

As to the statement by N2HOS that RTTY "shot itself in the foot", there are half truths in his 1), 2), 3) statements too! Most of us "RTTY'ers" (ACTUALLY BAUDOT'ers), do have other things 10 do, than monitor the DX window! However, if the "burst" modes migrate up into and down into the .080/.090 window, you could not hear the DX even if they were there -because you could not stand the "burst" noises long enough to tune around for the DX! If you did find the DX, you damn sure couldn't work it, because all the filtering you could ever put in a radio will not help! GET REAL!

The NUMBER ONE problem is NO BAND PLAN! To begin with, ADRS NEEDS TO TAKE STAND ON A BAND PLAN, TO PROTECT A SEGMENT FOR BAUDOT! Not every digital operator; subscribes to ADRS. You may not agree with all that ADRS does, but at least it is an outlet to a few of the dedicated digital operators, including the "Die Hard Baudot DX'ers"! I consider myself among this dedicated group. I believe ADRS is the digital operators' voice, BUT THEY MUST HELP PROTECT A BAUDOT SEGMENT! Is it not VERY STRANGE, that ARRL supposedly represents a large group of the amateur radio community, features every other topic on earth EXCEPT RTTY: ARRL will hardly ever mention the digital modes (other than "Packet Perspective"), except for their once a year RTTY Roundup! It is as if we baudot operators have a contagious disease or something! This is a prime reason for ADRS.

At a time when we finally got the ARRL to honor RTTY for the Honor Roll, let us use the KISS Formula, KEEP IT SIMPLE STUPID! SOMEHOW we MUST band plan, NOT ONLY STATESIDE, BUT WORLDWIDE, IF BAUDOT IS TO SURVIVE! The SIMPLE BAND PLAN is "Burst" below .080, "Burst" above .090, Baudot DX and contests on the 10 KHz in between! Of all the silly band plans 1 have seen presented by various groups in the past 5 years, WHAT IN THE WORLD COULD BE SIMPLER? The band plan by ARRL's so called Digital Committee a few years back was about as funny as Laurel & Hardy or the Keystone Cops, for those of you old enough to appreciate that! GET REAL, KEEP IT SIMPLE, TAKE A STAND and GET THE WORD OUT, "BAUDOT FOREVER!"

73, William D. Price, WA4MCZ
DXCC (RTTY), WAZ (RTTY), WAS (RTTY)

BITS & BYTES

VIBROPLEX CO. has new Owner

The Vibroplex® Co., Inc., the "Oldest Name in Amateur Radio"™, has been acquired by WA4OSR, S. Felton "Mitch" Mitchell, Jr., of Mobile, Alabama. Mitch, a charter member of the ADRS, is an extra class amateur first licensed in 1963. Mitch is the first ham to own the Company. Vibroplex will be moving all of its operations back to the south, where its roots began. All current Vibroplex products, including the Original bug, the Iambic, the Vibrokeyer, and the Brass Racer keys will continue to be produced.

Mitch says "The Vibroplex name is older than amateur radio and has come to represent the one piece of equipment in the ham shack that symbolizes the interest, camaraderie, and espirit de corps of the world-wide ham radio community. Even in this age of electronics, the heritage of Vibroplex has been passed down from generation to generation in the service of professional and amateur radio operators who demand quality. I intend to continue the unmatched Vibroplex quality, feel, simplicity, and performance." And, Mitch adds, "... be watching for some new, exciting products from Vibroplex in the near future."

The new address of Vibroplex is 11 Midtown Park, E., Mobile, AL 36606-4141. The new voice telephone numbers are 205-478-8873 and 800-840-8873. The new FAX number is 205-4760465.

Does Your Computer Keep the RighTime?

My experience has indicated that most DOS-based PC's have clocks which do not keep accurate time. My current 486 systems are like the 8088 and 286 systems which preceded them, and no better or worse than those which have been in use at my employer's (two of whom were and are in the PC manufacture and marketing game); all systems had clocks which had to be reset periodically to a standard time source. This was not very important in the past since the time of day usually evidenced itself mainly in the creation date/ time of files. Nowadays it is a far different story since most of us are using a log program which logs our contacts in real-time. I remember only a few months ago discovering at completion of a contest that several hundred contacts had all been logged with times in error by more than five minutes, because I'd forgotten to correct the clock before the contest! Perhaps you've been told that nothing can be done to alleviate the inherent inaccuracy of the PC's clock? That's not so; let me describe a shareware program that is keeping my PC's time accurate now to about 0.5 second per month!

RighTime is a clock correcting program for DOS-based PC/AT-class systems which will correct the DOS and CMOS Real Time Clocks, which may have errors as large as 5.5 minutes per day, to a DOS clock resolution in the range of 0.055 to 0.01 second. It occupies only about 7K of system RAM and can be loaded high. With RighTime installed as a resident program, the standard real time clock becomes an Adaptive Mathematically Compensated Crystal-controlled clock which will keep time within 0.5 second per week or better. That is an error rate of about 0.8 part per million, and is about 30 times better than a modern watch of quality.

RighTime is provided with an installation process which assures successful installation and startup. After the initial time-set, you should set the time accurately each day, ideally after booting at the beginning of a session, and again before shutting down at the end of a session. You'll quickly find that the necessity to set the time is reduced, as RighTime "learns" how much correction to automatically make. (It has been two weeks since I last corrected the time on my system, and it is within a half second of WWV; so close that I choose not to try to correct it).

RighTime is a copyrighted product of G. T. Becker and Air Systems Technologies, Inc. of Dallas, Texas. An evaluation copy is available from the ADRS bulletin board, or from the Air Systems Technologies BBS at (214) 869-2780 (1200-14400 N81). You may use the evaluation programs for up to one month, and you are encouraged to pass the unmodified evaluation distribution file to others. If you continue to use RighTime after the evaluation period, you are expected to register your use by returning the registration form with $40 to Air Systems Technologies. I'm sure that you, like I, have experienced shareware which for various reasons was not useful and not worth registering. I'm also sure that you, like I, will discover that this product is in a different category; it's a product that works as claimed to make your PC's clock extremely accurate, and is therefore well-worth the asked-for registration fee. Registered users receive a diskette containing the current version of the programs and additional utilities, a printed user manual and license agreement, automatic notification of new releases, and support from the author is needed. If accurate time is important to you, this product will make it happen.

Reviewed by Bob Boyd, W1VXV

MINI REVIEW

Propagation Prediction? It's a SNAP!

SNAP - an acronym for Signals, Noise and Propagation, is a DOS utility written by Crawford MacKeand, WA3ZKZ (formerly VP8CMY and G4ARR), which is available from the American Digital Radio Society. This program calculates a signal to noise ratio for each hour of a 24-hour period for a radio path between two sites, and displays a graph which plots the result against frequencies from 2 to 30 mhz. The maximum usable and lowest usable frequencies for any hour of the day are quickly apparent.

SNAP can be run either from a floppy or a hard disk (it requires only 175 KB of disk space), and it is menu-driven. Prior to using SNAP, it's best to obtain the current solar flux and A index values from WWV (or your local packet cluster). At the first startup, choose the 'E' (Enter) option to enter your call, location, and other local values, and then save to disk with the (Save) 'S' option. Now enter the solar flux and A index values, and then select the site at the other end of the desired radio path by entering call sign prefix (or US state abbreviation, or longitude and latitude). Now press 'C' (Compute) for a display of the projected radio circuit. It really is just as simple as that to run!

The default presentation screen shows a signal-noise 'map' against time and frequency where the SN ratio is in S-units. Similar maps can be selected with SN ratio in units of 10 dB, or with the signal in S-units (or in units of 10 dB) vs a base level of 1 microvolt per meter. Another very useful screen will compute and display projected band openings between the local site and 15 preselected remote sites, with each radio circuit labeled as Good, Fair, Poor, or Closed. Output can be routed to the printer as well as to the screen.

I have a registered copy of MINIPROP PLUS™ by W6EL Software, which also projects propagation paths but with more displays and in more detail. I compared the output of SNAP against MPP and found it to be consistently similar. MPP comes with a 60-page detailed manual and could be called the Cadillac of propagation predicting programs; SNAP would then probably be termed the Volkswagen. SNAP provides basic predictions similar to MPP, but more simply and at lower cost.

If you are a DXer, or you need to maintain a schedule with someone in another part of the country or world, you would probably find that SNAP would save you time and effort. Instead of guessing if a radio path is open at a specific time/frequency, just call up SNAP and you'll quickly know where and when to make that QSO.

Reviewed by Bob Boyd, W1VXV

Have you checked your mailing label lately?
If the ***Expiration 02/95*** appears next to your name, it means your **ADRS** membership, and subscription to the ***Digital Journal,*** expires with this issue.
To keep your membership, and all the latest digital news coming your way, just fill out the coupon on page 29 and mail it -- **Today!**

(TCP/IP - cont'd from page 13)

Figure 14 Example of Real-time Global Round Table QSO

```
*** om3twn signed off.
*** k5kgg signed off.
<kc6lrb>: OK.IM USING UR WORLD FAMOUS LAN-LINK LIKE IT A LOT.HI.
*** pelmar signed on.
*** k8ypu signed on.
<hg5bfl>: Hi g3zcz! Here is Bandi from Budapest.
*** wb2fzc signed on.
<hg5bfl>: This is a JNOS program with internet connection.
*** wb6dlg signed on.
<hg5aum>: <g3zcz>I'm on 144.650 , uplinking to gateway with AX25 'normal' packet...
<hg5bfl>: 73' to all, I will back. QRT>
<*db4rc*>: Hello from Chris in SE Germany
*** hg5bfl signed off.
*** ha2rx signed on.
<pelmar>: ****************************************
<wb2fzc>: Hello, Name is Alan, QTH nr Chicago
*** ve3dgt signed off.
<ha2rx>:  CQ, CQ and QSY to channel 25.
```

Figure 15 Typical List of Bulletins Arriving via the Internet

```
St.  #  TO            FROM      DATE   SIZE SUBJECT
> N   1 amsat         n3dci     Dec 09 33843 SPACENEWS, HST
  N   2 amsat@wa3nan. HRSBLACK Dec 10     2 Mir element set #21
  N   3 amsat@wa3nan. HRSBLACK Dec 10     2 ORBS$344.MISC.AMSAT
  N   4 amsat@wa3nan. HRSBLACK Dec 10     2 ORBS$344.OSCAR.AMSAT
  N   5 amsat@wa3nan. HRSBLACK Dec 10     2 ORBS$344.MICRO.AMSAT
  N   6 amsat@wa3nan. HRSBLACK Dec 11     2 ORBS$344.WEATH.AMSAT
  N   7 amsat@wa3nan. HRSBLACK Dec 11     2 ORBS$344.2L.AMSAT
  Y   8 amsat@wa3nan. /pn=PATR Jan 03 6819 Long Duration Balloon
GARC:WA3NAN-9 Area: amsat Current msg# 1.
?,A,B,C,D,E,F,H,I,IH,IP,J,K,L,M,N,NR,P,R,S,U,V,W,X,Z >
```

DX-ing the World via the Internet

If you have Internet access, and know the IP numbers of the hosts you can TELNET directly to the host, and after obtaining privileges, access other hosts and their local vhf/uhf ports and make real-time packet radio contacts in distant locations from your computer. If you don't know the IP numbers, you can try to reach the hosts by name. You may also be able to find them out by connecting to the hosts and using the "IH" and "IP" commands. Amateur TCP/IP system IP numbers begin with '44'. All other systems have numbers that begin differently.

The Future

The merger of packet radio and the Internet is going to change amateur radio in ways that we can only just get a glimpse of. The state of the art in Internet wormholes is akin to that of the PBBS ten years ago. As these links proliferate they will force us to rethink much of the way we use packet radio. How about these ideas as starters.

•As reliable real-time links to most parts of the world will come into existence. The concept of the local PBBS will tend to fade away when you can log into a PBBS half way around the world when you feel like it.

•The need to forward bulletins from PBBS to PBBS may be eliminated. Regional bulletin servers can be set up, and bulletins only forwarded between them. Bulletins uploaded to a PBBS will be sent to the closest regional server. Users can then access the hosts to download bulletins of interest. WA3NAN is already configured to provide bulletins on SAREX activities to anyone connecting from anywhere.

•Forget message forwarding via hf or OSCAR, wormholes have and will provide that service in a better way to the majority of packeteers. Forget waiting for a PACSAT to pass overhead before uplinking messages.

•It is almost impossible to tell a station's location from the host, alias and callsign prefix in the Node listings. Think about this, G3ZCZ joins a global round table QSO from a host in Krakow Poland, or a host in Hawaii. G3ZCZ, however is located in Silver Spring, MD.

•Connect to a PacketCluster in a distant location via a wormhole and announce yourself as trying to get through on an hf frequency.

If you think these ideas are far fetched, look at Figure 16 (see page 27). Amateur Radio has and continues to evolve. The future may be more exciting than we anticipate. *Access and explore a wormhole and see the future.*

BULLETIN

MFJ Enterprises Recently Licensed to Use Kantronics' G-TOR™

MFJ Enterprises, Inc. has been licensed to utilize Kantronics' patent-pending G-TOR technology. The lightning-fast G-TOR mode, developed by Kantronics, will likely be incorporated into MFJ's 1278-series multi-mode data controllers. The addition of G-TOR will enhance MFJ's data controllers with the highest data throughput rate available and will multiply the number of G-TOR based stations on the air. Once the G-TOR mode is implemented, MFJ will offer an update package for previous versions of the 1278 series.

Al W2TKU reports the ADRS BBS is ailing and down for a few days. The computer, which is dedicated to the BBS, simply ran out of steam despite the complete checkup and new 500 meg hard drive. It just goes to show you what happens to equipment when sysops and others dedicate their electronic gear to the betterment of the hobby. This particular computer ran the W2TKU Winlink BBS for a few years, grinding away 24 hours a day, 365 days per year. (I wonder if anyone ever said thanks). Now the "hospital" reports that a new power supply might solve the problem but the patient is undergoing further checkups. By the time you read this all should be back to normal.

Al has been working diligently to enlarge the library on the BBS. He has made very visible progress. In January, the Digital Journal begins to add to the supply of files as well (see Last Word page 30). Please note also that the Help file for RagChew will be uploaded to the BBS as soon as Jim, KE5HE completes it to his satisfaction. Many software updates find their way there as well, whether it is Winlink or WF1B's RTTY. Use it and keep up to date. The number (also dedicated to the BBS) is 813-922-5409.

#########

Crawford WA3ZKZ, a regular on the Digital Journal staff and a veteran digital operator of many skills, becomes the latest major contributor to the ADRS library of software.

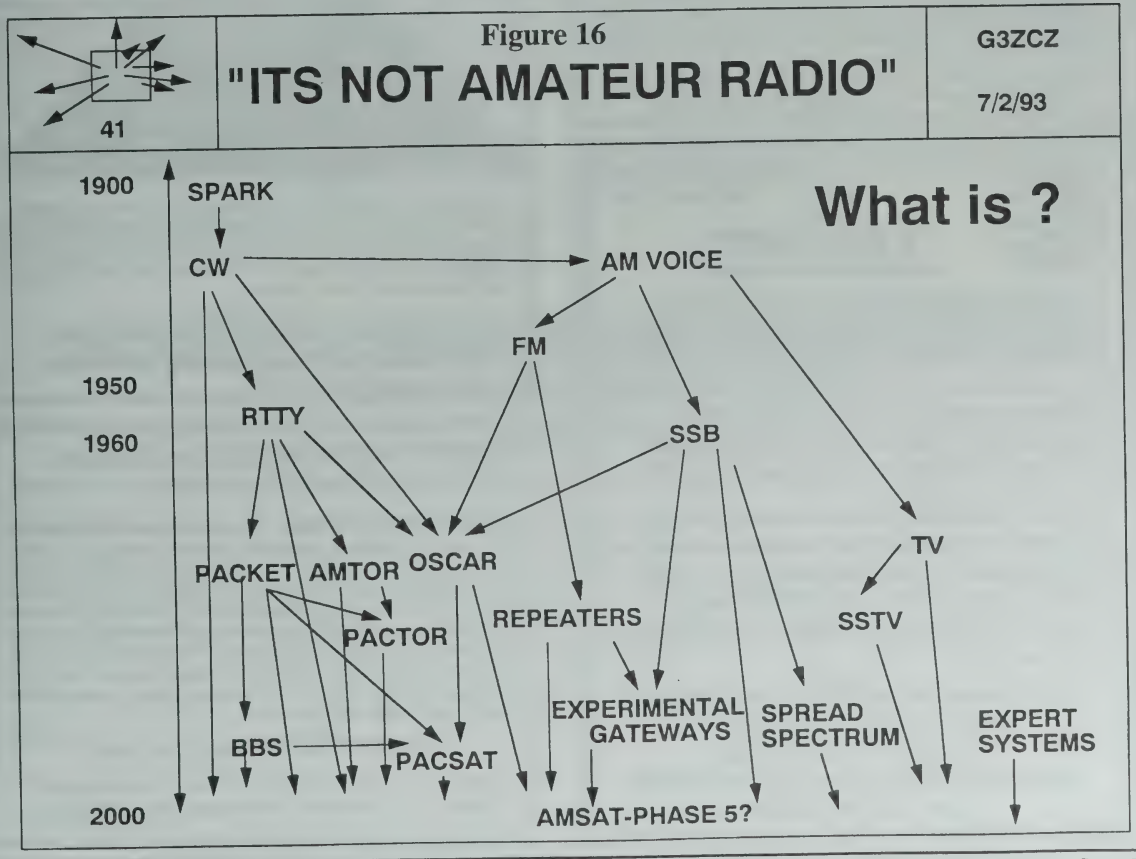
SNAP, reviewed by W1VXV elsewhere in the Digest, is now the property of the Society. It will be offered to members of ADRS for $15 postpaid anywhere in the world (nonmembers $30). This remarkable propagation tool takes a minimum amount of disk space and gives answers in a flash. SNAP is a natural for anyone who wishes to prowl the DX world! It is almost an unfair advantage in a contest if paired with WF1B's RTTY under DesqView. Flipping from one program to the other would take no more than a split second. Try it in the WPX! To Crawford, who offers so much of his time and talent to the Society, we offer our sincere thanks.

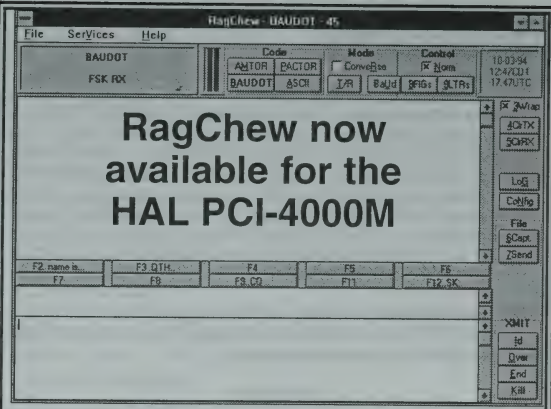
This new product is ready to be shipped now! Send your orders to ADRS at the Goldenrod address. Payment in US funds required (EuroCheques are accepted).

#########

The ADRS Board of Directors meet Thursday evening, April 27th at the Radisson in Dayton, OH. This will be the official annual meeting of the BOD and it will be followed by the membership meeting the next morning. Please mark your calendars and do contact any (or all) members of the BOD to express your views, complaints, hopes and fears. Crawford, WA3ZKZ will run the mini-forums the morning of April 28th at the Radisson and will soon be calling on some members to lend a hand. It will be a fascinating morning, for sure.

(TCP/IP- (cont'd from page 15)





Jim, KE5HE developed this exciting multi-mode Windows software for your new HAL card. Send RTTY, AMTOR, Clover and Pactor from the same easy-to-use and friendly interface. It will be shipping by mid-January. Available in station-license form, only from ADRS. $25, postpaid anywhere in the world, for members. $50 for non-members.

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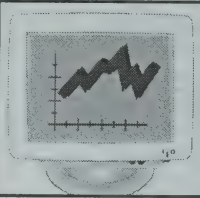

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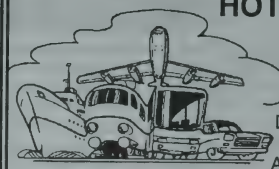

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If you plan to attend the Dayton Hamvention in 1995 and will need a room, the ADRS has reserved a block for your convenience. These rooms are at the Radisson Inn (north). This is where the digital gang stays. This is where special events will be held. Forums, hospitality suite, and the Digital dinner will are take place right here. Stay where all the action is - reserve a room today.

The rooms will accommodate from one to four people. The room rates are $86.00 per night. The hotel will need a deposit of $80.00 per room. We must know if you need a room NOW. We do not need your deposit money at this time, only your request. You will be advised later on when to send your deposit money.

To reserve a room, contact Dale Sinner, W6IWO via one of the following methods.

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Mail to: 1904 Carolton Lane, Fallbrook, CA 92028

CompuServ: 73074,435

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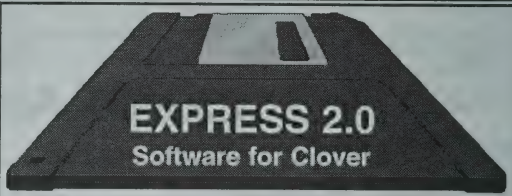
April 28-30. 1995



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For Sale - AEA PK-64 with HF modem, Commodore C-64, disk drive, printer, Sanyo monitor, all cables and documentation. Worked DXCC and WAS RTTY with this gear. Sold as a system only $175.00. Dovetron MPC-1000R-II $250.00. Barry Fox, W1HFN, 431 Mulpus Road, Lunenburg, MA 01462 Ph: (Days) 603-889-6600 Ext 320 (leave voice mail if not there); (e-mail) fox@imagitex.com (eves) 508-582-7521.

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The Last Word

from the Publisher

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MISCELLANY

There is still time. Unless your copy of the Digital Journal was delayed enroute, you still have time to get ready for the big ADRS WPX contest the weekend of February 4 and 5. In case you have no knowledge of what WPX stands for, it means that almost every station worked is a multiplier! Every distinct prefix counts—N1HOS, N2HOS and right on up to N0HOS is as good as XE1HOS or TU2HOS. Enjoy! And win one of the many plaques. You have a far better chance in this contest than any other, regardless of band conditions. **... and more time.** The ARRL Roundup and the ADRS WPX contest should provide a large chunk of the countries needed for this year's DX contest. Remember, don't sit on your log once you get the **"95 in 95"** countries entered. The earliest entry is the most important one even though you have the entire year if you want just the plain ordinary run-of-the-mill award.

Software developments. Barry VE3CDX (about whom you will be hearing more in coming months) announced to the world that he plans to develop **DX Cluster,** the successor product to AK1A's hugely successful DX PacketCluster. This totally new product will be 100% compatible with PacketCluster but include many new features as well. Barry expects to demonstrate DX Cluster about mid-year. He now seeks input at his E-mail address—
Internet:bgarratt@tor.hookup.net.
Stay tuned.
At the same time, Luck Hurder KY1T (KY1TLUCK@AOL.COM) says he is about to develop a new sophisticated BBS program for Windows. Written in Visual Basic, the program will require a fairly hefty 60mhz Pentium PC. He aspires to run AX.25 and TCP/IP at the same time on the same machine. According to some folks, that is a big challenge, but possible. Good luck, Luck.

Hardware developments. DSP simply won't go away as the hot topic of the year. There is a newer, higher power chipset for you experimenters now available from Texas Instruments. Call Wyle Electronics at 800-414-4144 and order the TI model 320C5X. It costs $99 plus $10 shipping. An eight week delay was reported before. Don't trust those reports.

High tech casualty. This is a direct quote from a recent fax to me—*"I am sending this fax because my fax machine ran out of paper the other day and so received only the header from you. The fax machine dumped its memory due to cockpit error on my part so I was unable to retrieve the balance of the message. Please re-send it." Ah, the wonders of our "connected" world!!*

KI7FX settles in. Mike Candy arrived "at home" in Wisconsin and is busily engaged in reentering civilian life. He and Nancy are now based in Shelby, WI, where their address is Box 331, Prescott, WI 54021-0332. Mike is not yet back on Internet but it is only a matter of time. He returns to the pages of the Digital Journal soon where his first task will be to prepare a multi-installment work about "getting started in HF digital." Mike is genuinely concerned about helping amateurs develop beyond the limited field of VHF packet, into long haul real-time digital communication. This series will be well worth your while whatever your experience level, and well worth passing on to those about to enter our ranks. It is a pleasure to have Mike back in harness.

Last Word goes on line, mid-month that is. Beginning in January, a special Last Word column will appear on the ADRS BBS. The column design will feature late breaking news and comment and will be uploaded on or about the 15th of each month. Al W2TKU will also pass it on to the packet network. Contest results will be posted as well. Once the contest is over the "high-claimed" scores will be assembled and posted as early as possible. W2JGR's DX column and N6GG's Contest column upload at the same time in zipped form. Please note that while late breaking DX bulletins will be seen on the BBS, these columns are simply the material that ran in the current month's issue and are not new columns. They are being placed on the BBS as a service to non-members (or more accurately) as a lure to non-members. Hi! Be sure and tell your friends.

Contest news. CAC assembled, to consider CHOF and COTY awards. (??? . . . look for clues below!). The **C**ontest **A**dvisory **C**ommittee of the ADRS is hereby constituted. Ron AB5KD is chairman, Jay WS7I is vice-chairman. The committee includes Ray WF1B, Hiro JH1BIH, Ron KP2N. Nominations from Europe are still in the works. Ron describes their immediate tasks...1) monitor, evaluate and improve the WPX contest 2) establish the digital **C**ontesters **H**all **O**f **F**ame and 3) set up and run the **C**ontester **O**f **T**he **Y**ear award and 4) collect comments and recommend changes for all digital contests. This is a blue-ribbon group and we look forward to major progress over the next year or so. Perhaps there may even be another contest in the wind! By the way, all members are on Internet so the meetings will be frequent, short, efficient; the decisions rendered with no delay. Please feel free to submit ideas, criticisms and comments to Ron AB5KD.

TCP/IP is another acronym in the news. Joe Kasser's intriguing article makes one wonder where the nearest NOS node might be. This idea has it all—PC's and mainframe computers, sophisticated software, disparate but integrated networks, RF links, live chat, simultaneous file transfer, multi-station links. . . to mention a few of its attributes. There is in all probability no way to deter its rapid growth. And the users will look at traditional hamming, snort and say, "Why go to all that bother and expense? If you want to chat with someone in China let me show you how." DX-ing via Internet, wormholes and two VHF links forges a trend and perhaps creates a new DXCC classification. Should we all shout "bravo?" Maybe not. Is there reason for concern? Is this merely another step in the ever-changing hobby or is it the next level of communication technology, a technology we must master if we are to stay abreast of digital developments?

Before we sip the champagne to celebrate its arrival, there is one potentially disturbing element in TCP/IP not mentioned elsewhere. By way of example, no rule requires "two RF links plus a wormhole" to play with TCP/IP. And if there was, nobody could enforce it. Listen to this. Who is to stop a non-ham at point "A" from dialing into Internet, going through the wormhole, automatically linking and then communicating, via VHF, with a licensed amateur at point "B." Nor, at least in theory, is there anything to stop

point "A" from being a Control Operator of the licensed station at point "B." This hybrid form of modern communication is readily available to anyone who can access a TCP/IP node. The unlicensed operator uses the wired link to enjoy the privileges of the licensed amateur at the other end of the combined link. Legal? Probably not, but I doubt the designers of the system worry too much about it for to them it is a logical extension of "the network." A moot point, it is not our purpose to debate the issue here, merely to point out that infiltrating the privileges of amateur radio operators is no more difficult than it is for the Internet experts of the world to plant a virus in one of the Pentagon's main frame. It happens!

Do we who have been kicking around the HF digital world for a few years feel the same way? In terms of equipment and knowledge we are essentially the same as the gang we call "the packet crowd." We each own and operate computers, TNC's, transceivers and antennas. But if you peel away the layers you discover fundamental differences. We could snort and say that the packet folk center their attention on the hardware, the software, the network, the switches, backbones, nodes . . . to the point that they act like a telecommunication company. Their objective it seems is to design, provide and maintain the "system" or network that allows an endless amount of traffic to flow around and around and around the loop. To some observers the RF part of the package seems almost incidental to the packet community, subordinated to the network, computer and software—and subject to easy replacement by landline, if available. And the TCP/IP phenomenon is the most recent evidence supporting such a conclusion.

Before we shake our head and say "Well, that's the way it is with those packet guys," think a bit about our history. Read Crawford's story of "Old Time RTTY," and be reminded of the burdens we digital folk impose upon ourselves. From the very beginning, it was never enough for us to have but a simple mike or key and the rig. That was for the unwashed. We, without fail, added a major challenge to our practice of the hobby—at least one balky, complicated, insufferable "thing," the mastery of which gave us great joy and a special place in the hierarchy of communication expertise. First it was the clunkers, then it was the computer, and the software, the satellites, the HF networks, multi-band and multi-mode. And we have yet to slow down. We claim to operate at or near the limit of current potential, and tend to look down our nose at other practitioners of the digital art.

On the other end of the digital spectrum of activity their "thing" is the network, the mastery of which gives them equal satisfaction and distinction and ultimately a 56K Baud backbone. Despite their late start, they have come a long way, too. The HF addict strives for the visceral keyboard-to-keyboard contact, the chat mode that is the essence of "HF" digital practice. This social contact, the live interchange, always claimed an importance equal to the technical challenge represented by the clunkers or the computers. We did it with blood sweat and tears, and maintained (at least in our minds) the purity of the HF link because we want to get on the air and talk to someone in a live-QSL-card-producing-real-time-honest-to-good QSO. Who's right? Neither and both, of course, for together our interests occupy but a corner of the menu required to meet the range of tastes offered by this hobby we call ham radio.

Contesting is a sport worthy of your time. I had an opportunity for the first time in several years to spend a few hours in the ARRL RTTY Roundup.[1] I had the time of my life, even though it was an unexpected pleasure. My FT1000D arrived from Yaesu at 7PM on Friday night, as the contest began, a mere 15 minutes following my call to Chip Margelli to complain about its long absence. After putting all the pieces together Friday evening, refreshing my knowledge of the contest software and completing the Saturday morning chores, I jumped into the fray. And had more fun at the keyboard than I have had in many months. There was a joyful noise on 20 meters, about 35 Khz wide! I pounced on every CQ I could find. That evening 40 meters was jumping with stations. I worked all four corners of the US. Finally, just before quitting for the night, I went back to a dead 20 meter band. Dead! I worked a ZL, A35, VP8, 5W, LU, CE and a KH6 with no measurable signal strength . . . and with 100 watts at this end, all in a matter of 35 minutes. No pileups, no competition, just repeated CQ's from great DX countries. I chuckled when I read someone's print Sunday morning. It was all about being bored to death with the contest because there was no DX!

The afterglow remains, even the next day. More than the thrill of competition, the contest experience provides an infinite amount of satisfaction in discovering that everything in your shack works in perfect harmony, even under such stress—the software, hardware and yes, even that error-prone operator at the keyboard! Don't miss this pleasure in the next one, the big one, the ADRS WPX contest. See you in the middle of the noise.

73 de Jim N2HOS sk

[1]Big results!! 158 Q's, 46 states and provinces, 23 DX, 10902 points according to WF1B's software calculation.

BULLETIN

ARRL'95 RTTY Roundup High Claimed Scores

Single Op High Power

Call	QSO's	Mults	Score
N5RZ	962	87	83694
WB7AVD	922	87	80214
VY2SS	731	71	66521
KA4RRU	752	86	64672
NN2G	659	99	64582
KN6DV	820	78	63960
KB4GID	753	83	62499
WE9V	642	89	57138
KK4DK	???	??	52000
NA4M	666	75	49950
N2DL	515	94	48410
KF3P	449	72	32328
NA2M	366	75	27450
N2FF	352	70	24640
WF5E	232	71	16472
W60TC	217	71	15470
W6IWO	208	73	15184
KB9ATR	346	34	11764
WD6L	180	65	11700
VE6JY	128	54	6912
VI0ANT	48	21	1008

Single Op Low Power

AASAU	987	94	92778
N1JAC	426	79	33654
WA6SDM	455	??	32305
K5ED	451	69	31119
VE6ZX	330	65	21450
N9BHH	328	72	21320
VE6WQ	305	68	20740
W6/G0AZT	270	69	18630
N5XUS	195	57	11343
N2HOS	159	23	10902
VE6JAV	153	55	8415
WU1F	100	46	4600
VE6LB	91	41	3690
N3BDA	???	??	2500

Multi/Single High Power

AB5KD	1318	112	147616
-0ps: AB5KD & WSTI (@ W5KFT)			
K1IU	1012	111	112332
-0ps: KIIU & WF1B			
KP2N	1077	94	101238
-0ps: KP2N & KP2E			
W4AQL	958	100	95800
-0ps. N9HZQ, KE4HAH, KC4QFR			
WX0B	862	99	85338
-0ps: WX0B & N50AO			
AA6KX	798	78	62224

Multi/Single Low Power

KQ4QM	555	85	47175
-0ps. ????			
W1BYN	398	69	27462
-0ps: ????			

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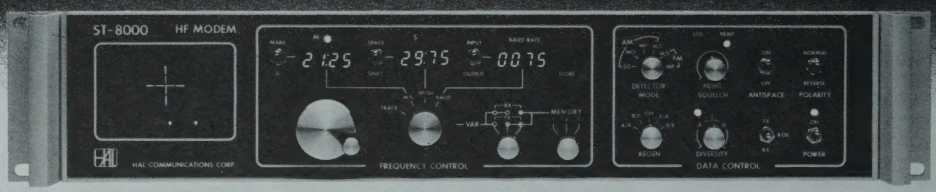

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Real HF radio teleprinter signals exhibit heavy fading and distortion, requirements that cannot be measured by standard constant amplitude BER and distortion test procedures. In designing the ST-8000, HAL has gone the extra step beyond traditional test and design. Our noise floor is at -65 dBm, not at -30 dBm as on other units, an extra 35 dB gain margin to handle fading. Filters in the ST-8000 are all of linear-phase design to give minimum pulse distortion, not sharp-skirted filters with high phase distortion. All signal processing is done at the input tone frequency; heterodyning is NOT used. This avoids distortion due to frequency conversion or introduced by abnormally high or low filter Q's. Bandwidths of the input, Mark/Space channels, and post-detection filters are all computed and set for the baud rate you select, from 10 to 1200 baud. Other standard features of the ST-8000 include:

- 8 Programmable Memories
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- Phase-continuous TX Tones
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- RS-232C, MIL-188C, or TTL Data
- 8, 600, or 10K Audio Input
- Signal Regeneration
- Variable Threshold Diversity
- RS-232 Remote Control I/O
- 100-130/200-250 VAC, 44-440 Hz
- AM or FM Signal Processing
- 32 steps of M/S filter BW
- Mark or Space-Only Detection
- Digital Multipath Correction
- FDX or HDX with Echo
- Spectra-Tune and X-Y Display
- Transmitter PTT Relay
- 8 or 600 Ohm Audio Output
- Code and Speed Conversion
- Signal Amplitude Squelch
- Receive Clock Recovery
- 3.5" High Rack Mounting

Write or call for complete ST-8000 specifications.

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